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ABSTRACT

Twenty-six elementary grade learning disabled (LD) students were observed over two entire school days to examine the extent to which students in different service delivery levels were provided with varying instructional approaches and opportunities to learn. Several differences were found in instructional approaches: less severely learning disabled students were allocated more time for academic activities, entire group teaching structures, and no teacher response than were more severely learning disabled students, who were allocated more time for other media, individual teaching structures, and teacher approval. However, few differences were found in students' opportunities to learn through active academic responding: less severely learning disabled students engaged in silent reading for greater amounts of time than more severely learning disabled students, but they also spent more time in inappropriate student responses. Academic responding time was low for all students, averaging less than 45 minutes per day, and variability among students was large, even within one service delivery level. Relationships among student response times and achievement gains generally confirmed the positive relationship between active academic responding and achievement and the negative relationship between inappropriate responding and achievement. The implications of the findings for service provision to LD students are explored. (Author)

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Research Report No. 78

ACADEMIC RESPONDING TIME FOR LD STUDENTS RECEIVING DIFFERENT LEVELS OF SPECIAL EDUCATION SERVICES

Martha L. Thurlow, James E. Ysseldyke, Janet Graden,
Jean W. Greener, and Carol Mecklenberg

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June, 1982

Abstract

Twenty-six LD students were observed over two entire school days to examine the extent to which students in different service delivery levels were provided with varying instructional approaches and opportunities to learn. Several differences were found in instructional approaches: less severely learning disabled students were allocated more time for academic activities, entire group teaching structures, and no teacher response than were more severely learning disabled students, who were allocated more time for other media, individual teaching structures, and teacher approval. However, few differences were found in students' opportunities to learn through active academic responding: less severely learning disabled students engaged in silent reading for greater amounts of time than more severely learning disabled students, but they also spent more time in inappropriate student responses. Academic responding time was low for all students, averaging less than 45 minutes per day, and variability among students was large, even within one service delivery level. Relationships among student response times and achievement gains generally confirmed the positive relationship between active academic responding and achievement and the negative relationship between inappropriate responding and achievement. The implications of the findings for service provision to LD students are explored.

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Academic Responding Time for LD Students Receiving Different Levels of Special Education Services

Instruction for learning disabled (LD)[1] students supposedly has undergone major shifts in focus since the need for special education for these students first was proposed (cf. Chall, 1978). Further, because definitions of "learning disability" have varied from state to state (Mercer, Forgnone, & Wolking, 1976), the characteristics of LD students in one state often are different from those of LD students in another state. In fact, the definitions and characteristics of LD students may change from one community to the next (cf. Ysseldyke, 1979). Even within one community, educators have recognized that there are variations in the characteristics of students categorized as learning disabled (cf. Ysseldyke & Algozzine, 1982).

The existence of variable characteristics within special education categories, and presumably the corresponding variance in instructional needs, led Deno (1970) to propose a cascade model of special education services. For the public schools, this model outlined a continuum of services from regular classroom placement (least restrictive) through homebound services (most restrictive). Some states have adopted this type of model in providing services to LD students, varying the level of service received by the student according to the severity of the student's disability.

Recent surveys have demonstrated considerable variability in the instructional interventions used with LD students across the nation (Potter & Mirkin, 1982; Thurlow & Ysseldyke, 1982). However, the surveys did not gather data on the extent to which variability was a function of the characteristics of the students being served. One relevant characteristic that has been ignored to a large extent is the severity of the student's learning disability (cf. Poplin, 1981).

In investigating instruction for students, variables that have been identified as critical are the amount of time the student receives instruction in specific content areas, using specific kinds of materials, as well as how the teacher interacts with the student, and what the student does while in class (cf. McCormick, Cooper, & Goldman, 1979). Teacher reports on the instructional time being provided to students is one approach that might be used to study differences in education for students in different service delivery environments. However, agreement between teacher reports and what actually takes place has been shown to be minimal (Felsenthal & Kirsch, 1978, Frederick, Walberg, & Rasher, 1979; Jacobsen, 1980; Karweit & Slavin, 1981). Observational procedures generally have been more fruitful; observed time in instruction, and even more specifically, students' active responding time, have been shown to relate directly to students' achievement in school (cf. Graden, Thurlow, & Ysseldyke, 1982a).

Although observation has been used with increasing frequency to examine regular class students' academic responding time, engaged time, or opportunity to learn, little has been done with LD students. Of those studies that have used formal observational techniques, most compared LD students as a group to students having other labels or to normal students. In one observational investigation that compared LD and non-LD secondary students in a mainstream class, three types of student behaviors were observed: study behaviors, social behaviors, and classroom conduct behaviors (Schumaker, Sheldon-Wildgen, & Sherman, 1980). LD students were found to spend more time than non-LD students in reading, writing, and note-taking study behaviors, and somewhat more time in rule violations. Student-teacher interactions of LD and non-LD secondary students during a mainstream class also have been observed (Powell, Suzuki, Atwater, Gorney-Krupsaw, & Morris; 1981; Skrtic, 1980). Interactions were found to be similar for the two groups: teachers called on and offered assistance to LD and non-LD students with equal frequency; students in the two groups volunteered answers and requested help equally often; and, students received about the same proportion of approval and disapproval.

In a study that compared third-grade LD students to nonhandicapped high achievers, nonhandicapped low achievers, and behaviorally handicapped students (Thompson, 1979), teacher-student interactions were the focus of observations. No differences were found between low-achieving students and LD students. However, teachers initiated more interactions overall and gave more feedback overall to LD students than to high achieving students, and asked fewer low level questions of LD students than of behaviorally handicapped students. These differences were based on observations of only dyadic interactions of the teacher and student; thus, much of what happened in the classroom was excluded from analysis.

Another study compared LD and non-LD third and fourth grade students over two entire school days (Thurlow, Graden, Greener, & Ysseldyke, 1982). Using one of the more comprehensive observation systems (Greenwood, Delquadri, & Hall, 1978; Greenwood, Delquadri, Stanley, Terry, & Hall, 1981; Hall, Greenwood, & Delquadri, undated; Stanley & Greenwood, 1980), this study found no differences in the times allocated to specific activities. However, there were significant differences in the type of instruction received: LD students received significantly more individual instruction than non-LD students; conversely, non-LD students received significantly more instruction within an entire group structure. Thurlow et al. also found that LD students received about three times as much teacher approval as non-LD students. Although the school day for the students was approximately 390 minutes, almost half of that time was spent in activities not covered by the observation system (lunch, recess, music, physical education, special assemblies, bathroom breaks, moving between classrooms). About three hours were allocated to academic activities. Yet, active academic responding time by the students was small, averaging about 45 minutes per day.

Zigmond, Vallecorsa, and Leinhardt (1980) observed LD students within the special classroom; no comparison groups were included in the study. These investigators found that although the students were in school for approximately 287 minutes each day, nearly one-third of that time was spent making responses unrelated to academics (off-task responses and waiting or management responses).

The present study was conducted to examine the nature of instruction and academic responding time for LD students receiving different levels of special education services. The observation procedures used by Thurlow et al. (1982) were selected to avoid some of the difficulties encountered in other studies of classroom variables related to students' learning and students' characteristics (cf. Graden et al., 1982a). Specifically, the observation system recorded activity, task, and structure, as well as teacher position, teacher activity, and student response, on a 10-second interval schedule. Each subject was observed for two entire school days on the 10-second interval coding schedule.

Research Questions

Numerous research questions were posed in this investigation. Of these, eight were considered to be of major interest for the present report on the nature of instructional and responding times for students in five levels of LD services:

(1) To what extent are there significant differences in time allocated to various activities for students in different LD service delivery levels?

(2) To what extent are there significant differences in time allocated to academic versus non-academic activities for students in different LD service delivery levels?

(3) To what extent are there significant differences in time allocated to various tasks for students in different LD service delivery levels?

(4) To what extent are there significant differences in time allocated to various teaching structures for students in different LD service delivery levels?

(5) To what extent are there significant differences in time allocated to various teacher positions for students in different LD service delivery levels?

(6) To what extent are there significant differences in time allocated to various teacher activities for students in different LD service delivery levels?

(7) To what extent are there significant differences in time spent in various student responses by students in different LD service delivery levels?

(8) To what extent are there significant differences in time spent in academic responding, task management, and inappropriate behaviors by students in different LD service delivery levels?

In addition to these research questions, the present report also addresses: (a) what the "typical" school day is like for elementary LD students, (b) the relationship between time in various student responses and achievement, and (c) differences between LD students at different service levels that were not coded by the observational system.

Method

Subjects

Twenty-six students from 25 classrooms in 11 elementary schools served as subjects. Students receiving LD services at levels 1-4 (N=23) were from 24 classrooms in 10 elementary schools in a suburban school district. Level 5 subjects (N=3) were from two classrooms in one elementary school in an urban school district. The program for level 5 students was one of only a few within public schools in the metropolitan area in which the study was conducted. There were no level 5 students in the suburban school district from which the other students were selected.

The five levels of LD service were defined in terms of the amount of specialized help received by the student. Level 1 students received indirect LD specialist help in the form of follow-up monitoring and perhaps some consultation between the LD teacher and the regular classroom teacher. Level 1 students did not leave the regular classroom for services. Level 2 students received more direct help from the LD specialist, but still only within the regular classroom. The LD teacher provided the regular classroom teacher with special support services for the student or sometimes entered the regular classroom to provide the student with special tutoring for a small amount of time. Level 3 students received special LD services outside of the regular classroom for part of the day (up to 1/2 day, or 3 hours). Level 4 students received special LD services outside of the regular classroom for more than half of the day. Level 5 students received all instruction within a special LD classroom. It was assumed that the level in which a particular student received services reflected the severity of the student's learning disability or the degree of learning impairment evidenced by the student; the higher the number of the level in which the student received services; the greater the severity of the student's learning disability.

All students were in grades three (N=15) and four (N=11); 17 were male and 9 were female. The homeroom teachers of the level 1-4 students included 17 females (12 3rd grade, 5 4th grade) and 6 males (1 3rd grade, 5 4th grade). The level 5 teachers, each of whom served both third and fourth grade students, were both female.

All teachers and students were volunteer participants in the observational study. In the suburban school district, consent forms were sent to teachers and the parents of all students by the school district at the beginning of the school year. In the urban school district, consent forms were sent to teachers and the parents of all students in their classrooms by the LD coordinator in the spring.

Students were selected randomly from each level of service, with three each from levels 1, 2, 4, and 5 and the remaining 14 from level 3. This distribution was reflective of the general distribution in the population.

Observation System

The CISSAR (Code for Instructional Structure and Student Academic Response) observation system was used in this study. The version of the system employed was developed by the Juniper Gardens Children's Project in Kansas City, Kansas (Greenwood et al., 1978). The system focused the observation on the behavior of one target student (rather than sampling behaviors of several students) and allowed observers to record six event areas: (a) activity (12 codes), (b) task (8 codes), (c) teaching structure (3 codes), (d) teacher position (6 codes), (e) teacher activity (5 codes), and (f) student response (19 codes). Seventeen stop codes also were used to record reasons for termination of observation. Table 1 is a list of the event areas and the specific events recorded within each area. Detailed definitions and examples are presented in Appendix A. Excluding the stop codes, a total of 53 different events could be recorded with the CISSAR system.

Insert Table 1 about here

An interval time sampling technique was used to direct the recording of events. Three event areas were recorded every 10 seconds over the entire school day while the student was in the classroom. Coding was structured into blocks of seven 10-second intervals. During the first 10-second interval, activity, task, and teaching structure were recorded. During each of the next 10-second intervals, teacher position, teacher activity, and student response were recorded. This pattern was maintained throughout the observation.

An auditory electronic timer attached to a clipboard was used to signal the 10-second intervals. The timer was equipped with an earplug so that only the observer could hear the signal (a short beep sound). The clipboard was used to hold coding sheets and to provide a hard surface for marking events.

The coding sheets, modeled after those used by the Juniper Gardens Children's Project (Stanley & Greenwood, 1980), were designed at Minnesota's Institute so that they could be read automatically by an optical scanner (see Appendix B). To be read correctly by the scanner, the circles on the coding sheet had to be dark and completely filled. In addition to spaces for coding student identification and start and stop times, each sheet contained three blocks representing 70 seconds each. Each completed sheet represented 3.5 minutes of observation time.

Observers

Eleven individuals served as observers during the present study. Nine of the observers were responsible for the majority of the observations. The other two observers were substitutes who filled in for reasons of sickness, make-up observations, and so on. These substitute observers were Institute staff members who conducted observer training sessions and monitored the regular observers. The regular observers were all females who had been selected from a pool of 50 female applicants who had responded to an ad in a local newspaper. A prerequisite for consideration was that the applicant not have a background in education; the goal was to minimize biases that might be brought to the classroom setting. Additional selection criteria included average or above average reading ability and performance on selected parts of a general clerical skills test. A personal interview with one of two IRLD staff members comprised the final step of selection.

Of the nine selected observers, two had attended college for at least one year and one had a BA. Two others had completed a business or vocational school program. Previous employment varied greatly, including sales, clerical, foster parent, own business, and social worker. All but two observers had a child or children in elementary or secondary school. Observers did not work in schools in which their children were enrolled.

Procedures

Observer training. Training of observers in the observation system was accomplished through the use of an Observer and Trainer's Manual (Stanley & Greenwood, 1980). The manual presented eight units that, according to the authors, were sequenced in terms of the complexity of the recording skills covered. Training required observers to read materials and then practice coding small numbers of events through the use of a variety of other media, including flashcards, overheads, and videotapes. Exercises and quizzes were presented throughout the manual. Mastery (100% correct) of the material in each unit was required before continuing in the training to the next unit.

Training in the system was conducted by four Institute staff members. Two weeks of half-day training sessions were required to cover the material presented in the manual. This was followed by two to three days of practice coding within actual classrooms.

Data collection. The trained educational observers coded activities on either a whole-day (one observer all day) or half-day (one observer for morning, another for afternoon) basis. Typically, observers did not code continuously for a period of more than 1 1/2 - 2 hours because of breaks within the school day. Observations were not conducted during breaks, such as those for lunch, recess, and bathroom. Also, observers did not code during physical education, music, or special assembly programs since the observation system did not apply to these situations. Observers did follow target students when they left their homerooms to go to other classrooms for other subjects (typically reading and/or mathematics), or when they went to the LD teacher for special instruction. Coding was conducted in these other classrooms in the same manner as in homerooms. Regardless of the physical setting, observers attempted to position themselves to be unobtrusive and to avoid revealing the identity of target students to the target students themselves or to other students.

Use of the optical scanner coding sheets typically required observers to mark only slashes in the appropriate circles while observing because the 10-second interval did not provide enough time for circles to be darkened sufficiently to be read accurately by the optical scanner. As a result, observers darkened the slashed circles after the actual observation was completed, either during break periods, in the evenings, or on the weekends. This procedure tended to reduce errors in the coding of data.

Frequently, the coded observational data were supplemented with an anecdotal recording. Generally, anecdotal recordings were used to provide a description of the classroom setting, the target student, and anything unusual that may have occurred during observations. The observers were provided with guidelines for anecdotal recordings (see Appendix C) to help them determine when they were needed and what they should cover.

Each target student was observed for two full days by observers. The decision to collect two days of data on each student was based on stability analyses presented by Greenwood et al. (1981), in which they found one day of observation predicting 62% and 92% of the variance for activity and student response, respectively. The observations were scheduled so that students would not be observed twice on the same day of the week; typically, the two days of observation were consecutive. All observations (2 days for 26 students) were completed between January and April.

In the present study, it was impossible to keep observers blind as to the LD classification of the students they observed since most of the LD students met with an LD teacher for some part of the day. However, they were unaware of each student's level of service. It was also difficult to keep teachers unaware of the identity of students being observed. For this reason, teachers were asked to help observers identify the students and to provide them with the students' schedules.

Reliability. Reliability checks were conducted throughout the study. These checks were conducted by another observer (designated the "reliability observer") who joined the observer in the classroom and coded events on the target student for approximately 14 minutes (4 pages of observation). During this study, 10 reliability checks were completed.

Two types of reliability were checked: (a) behavioral, and (b) sequential. Behavioral reliability was a measure of observer agreement on a specific event being observed; behavioral reliabilities were calculated for (a) teacher position, (b) teacher activity, and (c) student response. The second type of reliability, sequential reliability, was a measure of observer agreement on a sequence of items; this measure was designed to document that observers were coding in the sequence required by the observation system. According to the CISSAR training manual, the desired levels of reliability were 90% for behavioral reliability and 85% for sequential reliability. Table 2 presents a summary of the reliabilities obtained during the present study.

Insert Table 2 about here

To maintain adequate levels of reliability throughout the study, meetings were held to discuss coding problems, reliabililty disagreements, and so on. These were held on a weekly basis for the first two weeks of the study, and then on a biweekly basis after that. At the meetings, definitions were reviewed and any disagreements were resolved.

Achievement testing. Level 1-4 students in the present study were administered the Peabody Individual Achievement Test (PIAT; Dunn & Markwardt, 1970) by LD personnel within the suburban school system. The PIAT was administered to most students both at the end of the school year and at the beginning of the year or sometime previous to that. Level 5 students were administered the PIAT at the end of the school year by a trained tester who was one of the Institute staff members. "Pre" scores on the PIAT were not available for these students.

End-of-the-year PIAT scores were obtained for 20 of the students (76.9%). The remaining students were not tested either because they had moved (3.8%), because parental permission for providing test scores to Institute staff was not given (7.7%), or because the school system's LD staff had decided that a fall testing would be more appropriate (11.5%). End-of-the-year PIAT data were available for one level 1 student (33.3%), two level 2 students (66.7%), 11 level 3 students (78.6%), three level 4 students (100.0%), and three level 5 students (100.0%).

"Pre" PIAT scores were obtained for 16 of the students (61.5%): one level 1 student (33.3%), two level 2 students (66.7%), 11 level 3 students (78.6%), two level 4 students (66.7%), and no level 5 students (0.0%).

Data Analysis

Total amounts of time each student spent in the 53 observed events and in five event composites over the two days of observation comprised the dependent measures that were analyzed in this study. However, for descriptive purposes, these times were transformed to represent the time spent in each event during one school day. Because the observation system was designed to record as much data as possible during each 10 second interval, the activity, task, and structure were coded once every 70 seconds while the teacher position, teacher activity, and student response were coded six times every 70 seconds. Thus, transformations of times from the recording system produced slight overestimates of the time spent in each activity, task, and structure, and slight underestimates of the time spent in each teacher position, teacher activity, and student response. The transformed times appear in all figures and tables, but were not used in the actual data analyses.

All data were analyzed using one-way ANOVAs to test for significant differences ($p < .05$) between the group means. Further, because some of the significant Fs might occur by chance due to the large number of ANOVAs conducted, only those findings that exceeded the number that would be expected by chance for each research question (5%) are reported.[2]

Student-Newman-Keuls follow-up tests were run on all variables meeting the significance criteria described above. A .05 level of significance was adopted for these follow-up tests.

In addition to comparing the means of the students in the five service delivery levels, comparisons were conducted with students in levels 1 and 2 combined and students in levels 4 and 5 combined. This latter analysis allowed for the examination of differences between three approaches to service delivery: (1) delivery within the regular classroom setting (levels 1 and 2), (2) delivery within a resource room for relatively brief time periods (level 3), and (3) delivery within a special setting for relatively extended time periods (levels 4 and 5).

Students' end-of-the-year PIAT data were correlated with their student response times. Further, for those students having both pre and post scores on the PIAT, correlations were calculated between the changes in their PIAT scores, and their observed student response times.

Results

A Typical School Day

For students in levels 1-4, the total school day was 390 minutes; this included all time from when they arrived at school in the morning to when they left in the afternoon. The total school day for level 5 students was 345 minutes. Analysis of the total amount of observed time indicated that there were no significant differences among the five groups.

A typical school day for the 23 level 1-4 LD students derived by averaging across all students, is depicted in Figures 1-6. These figures represent the average time devoted to each activity, task, structure, teacher position, teacher activity, and student response. Although the total school day was 390 minutes, students were observed for only slightly over half of this time. During the remaining time, students were involved in activities not included in the observation system (such as lunch, recess, music, special assemblies, etc.)

Insert Figures 1-6 about here

When students could be observed, most time was allocated to academic activities; three activities were allocated the most time: about 57 minutes were devoted to reading, about 43 minutes were devoted to math, and about 30 minutes were devoted to language (see

Figure 1). The major task for students was readers, followed by other media, worksheets, and workbooks (see Figure 2). Most time was devoted to an entire group teaching structure (see Figure 3), and the teacher most often was positioned among students (see Figure 4). The most frequent teacher activity consisted of no response to the target student; this was followed by teaching (see Figure 5). Student responses most often were task management responses (about 1 1/2 hr), especially passive responses such as listening, waiting, etc. (see Figure 6). For student responses that were academic in nature, most time was spent writing. Inappropriate student responses accounted for about 30 minutes of the student's observed school day.

Variability. The times presented in Figures 1-6 represent average times across students; they give no indication of the extreme variability in times for individual students. The average times and ranges of times for some of the events showing the greatest variability across all students are shown in Table 3. The average times and ranges of times for all observed events are presented in the tables in Appendix D. As is indicated in these tables, large differences in times existed among the LD students. For example, on the days observed, one student was allocated no time in individual instruction while another student was allocated over 1 1/2 hours in individual instruction; one student spent about 5 minutes looking around while another student spent 28 minutes doing so. The extreme variability in times for individual students should be kept in mind when considering the average times found for the various events that were observed.

Comparison of LD Students Across Five Service Levels

Although a significant difference was not found among the five groups of students in the total amount of time observed, the average times did vary from a low of 168.4 minutes (2.9 hr) for level 5 students to a high of 232.3 minutes (3.9 hr) for level 2 students. As times are broken down into various activities, tasks, and so on, differences between actual times may be significant when the percentages of total times are nearly equivalent; on the other hand, differences between actual times may be insignificant when the percentages of total times appear very divergent. The actual amount of time is considered to be the critical measure (cf. Graden et al., 1982a); thus, statistical tests were conducted on actual times. However, percentage data also are presented for comparison purposes.

Activity. The average amounts of time and percentages of time allocated to various activities during one school day for LD students in levels 1-5 are presented in Table 4. A significant difference was found among the five groups in the time allocated to math, $F(4,21)=4.22$, $p=.012$. Follow-up tests indicated that more time was allocated to math for students in level 2 (52.7 min) than for students in level 5 (22.8 min). This difference is reflected in the percentages of total observed times allocated for level 2 (22.7%) and level 5 (13.5%) students. All other groups had allocated times for math in between these two and were not significantly different from either. For students in all service levels, most time was allocated to reading and math; these activities accounted for over 40% of the observed school day for students in each level. Within level 5, however, less time was allocated to math than to language.

Insert Table 4 about here

Activity composites. In analyzing the time allocated to various activities, composites were formed to compare the times spent by students in levels 1-5 in academic activities (reading, math, spelling, handwriting, language, science, and social studies) and in non-academic activities (arts/crafts, free time, business management, and transition). Table 5 shows the average amounts of time allocated to these two activity composites during one day for students in each service level. A significant difference was found among the five groups in time allocated to academic activities, F(4,21)=5.11, p=.005. Follow-up tests indicated that more time was allocated to academic activities for students in levels 2 (190.1 min or 3.2 hr) and 3 (186.2 min or 3.1 hr) than for students in level 5 (133.7 min or 2.2 hr). Examination of Table 5 reveals that the percentages of total times allocated to academic activities were very similar for students in level 2 (81.8%) and level 5 (79.4%); however, the actual time difference amounted to one hour. No differences were found among the five groups in the time allocated to non-academic activities.

Insert Table 5 about here

Task. Table 6 is a list of the average amounts of time allocated to various tasks during one school day for students in levels 1-5. A significant difference was found among groups in the amounts of time students listened to lectures $\underline{F}(4,21)=3.10$, $\underline{p}=.038$. Follow-up tests did not identify the source of the difference, suggesting that the significance of the difference is questionable (Winer, 1971). No other differences were found in the amounts of time allocated to various tasks for students in levels 1-5.

Insert Table 6 about here

Teaching structure. Two statistically significant differences were found in the amounts of time allocated to various teaching structures for students in levels 1-5 (see Table 7). Follow-up tests indicated that the significant differences between groups in time spent in entire group structures, $\underline{F}(4,21)=6.57$, $\underline{p}=.001$, was due to the greater amount of time spent by students in levels 1-3 as compared to students in levels 4 and 5. Students in levels 1-3 spent from 2.1 hours to 3.0 hours in entire group instruction while students in level 4 spent less than one hour (56.7 min) and students in level 5 spent just over one hour (1 hr 24 min) in entire group instruction. For the significant difference among groups in time spent in individual structures, $F(4,21)=5.96$, $p=.002$, follow-up tests indicated that level 4 students were allocated more individual instruction (86.8 min or 1.4 hr) than students in all other levels, who spent from 14.6 minutes to 29.8 minutes in individual instruction. It is interesting to note that times in individual structures increased from level 1 to level 4 but then dropped at level 5; time percentages reflected this pattern also. No differences among groups were found in time allocated to small group structures.

Insert Table 7 about here

Teacher position. The average amounts of time during one school day spent by students in levels 1-5 with the teacher in various positions relative to the student being observed are shown in Table 8. No significant differences were found in the amounts of time spent with the teacher in various positions for students in five service levels. Students in all levels spent the most time with the teacher among students.

Insert Table 8 about here

Teacher activity. Table 9 is a summary of the average amounts of time spent by students in levels 1-5 with the teacher involved in various activities during one school day. For all groups, most time was spent with the teacher making no response to them; the actual amount of time ranged from 1.6 hours to 2.0 hours and reflected from 52.5% to 71.1% of the observed school day. Very small amounts of time were spent with the teacher giving either approval or disapproval to target students; approval time ranged from 6 seconds to 1.7 minutes and disapproval time ranged from 30 seconds to 1.4 minutes. Although the ANOVA indicated a significant difference between groups in teacher approval time, the follow-up tests did not identify the source of any differences.

Student response. Significant differences between times spent in various student responses by level 1-5 LD students emerged for only one of the 19 student responses (see Table 10). The significant difference was found for the inappropriate student response of looking around, $F(4,21)=3.72$, $p=.019$. Follow-up tests indicated that students in level 1 spent more time looking around than students in levels 4 and 5.

Insert Table 10 about here

Student response composites. Table 11 presents the average amounts of time students spent engaged in active academic responses (writing, playing academic games, reading aloud, reading silently, talking about academics, answering academic questions, and asking academic questions), task management responses (passive responses, raising hands, looking for materials, moving to new academic stations, and appropriate play), and inappropriate responses (disruption, inappropriate play, inappropriate task, talking about non-academics, inappropriate locale, looking around, and self-stimulation). Differences between groups were found for the inappropriate student response composite, F(4,21)=3.42, p=.026. Follow-up tests revealed that students in level 2 spent more time making inappropriate responses (about 45 min per day) than did students in level 5 (about 15 min per day).

Insert Table 11 about here

Comparison of LD Students Grouped by Extent of Services

Activity. Table 12 is a list of times allocated to various activities for three groups of LD students (levels 1 & 2, level 3, levels 4 & 5). None of the differences between these groups was significant.

Insert Table 12 about here

Activity composites. A significant difference was found in the time allocated to academic activities for students in the three groups, F(2,23)=5.50, p=.011 (see Table 13). Follow-up tests indicated that students in level 3 were allocated more time for academic activities than were students in levels 4 and 5 combined.

Insert Table 13 about here

Task. Table 14 is a summary of the average amounts of time allocated to various tasks. Two significant differences among groups were identified by the ANOVAs: time allocated to readers, and time allocated to other media. Follow-up tests did not isolate the difference related to readers, thus suggesting that the finding of a significant difference is questionable. For other media, follow-up tests indicated that students in levels 4 and 5 were allocated more time with other media (about 1.1 hr) than were students in levels 1-3 (about 0.7 hr).

Insert Table 14 about here

Teaching structure. Significant differences among the three groups of LD students emerged in time allocated to entire group teaching structures F,(2,23)=10.20, p=.001 (see Table 15). The follow-up test indicated that students in levels 1-3 were allocated significantly more entire group time (about 2.6 hr) than were students in levels 4 and 5 (about 1.2 hr). Still, for students in levels 4 and 5, entire group structures were used more than any other teaching structure, accounting for almost 39% of the observed day. Yet, this is in striking comparison to the 71% figures for students in levels 1-3.

Insert Table 15 about here

Teacher position. The average amounts of time during which the three groups of LD students received instruction with the teacher in various positions relative to the students being observed are shown in Table 16. No significant differences among groups emerged. All students spent most time with the teacher among students, followed by either in front of the class or beside the student.

Insert Table 16 about here

Teacher activity. Table 17 is a list of the average amounts of time the teacher was involved in various activities with the three groups of LD students during one school day. For all groups, the teacher was making no response to the target student for the greatest amount of time; however, the groups did differ significantly in the amount of no response time received, $F(2,23)=3.65$, $p=.042$. Follow-up tests indicated that students in levels 1 and 2 received more no response time (about 2.0 hr) than students in levels 4 and 5 (about 1.5 hr). Further, significant differences emerged in the amounts of approval time received, $F(2,23)=5.83$, $p=.009$, with students in levels 4 and 5 receiving more (about 1.4 min) than students in other levels (from 12 sec to 30 sec). It is interesting that while teacher disapproval was much greater than teacher approval for students in levels 1-3, teacher approval was approximately equal to teacher disapproval for students in levels 4 and 5.

Insert Table 17 about here

Student response. Significant differences emerged among the three groups of LD students for times engaged in three student responses (see Table 18). Students in levels 1 and 2 were engaged in silent reading for a significantly longer time (12.5 min) than students in levels 3-5 (from 3.1 to 7.1 min), *F*(2,23)=5.45, *p*=.012. However, students in levels 1 and 2 also engaged in inappropriate play (8.3 min) more than students in levels 3-5 (from 4.1 to 2.9 min), *F*(2,23)=3.69, *p*=.041. Further, students in levels 1 and 2 looked around for greater amounts of time (22.2 min) than students in level 3 (15.6 min), who also looked around for greater amounts of time than students in levels 4 and 5 (9.6 min), *F*(2,23)=7.41, *p*=.003. For all groups of students, the most frequent active academic response was writing, accounting for about 13% (from 16.8 to 23.8 min) of the observed day. The most frequent student response overall was passive responding, which accounted for about 40% (from 60.4 to 79.8 min) of the observed day. Students spent more time engaged in passive responses (waiting, listening, etc.) than in all active academic responses.

Insert Table 18 about here

Student response composites. Table 19 is a summary of the average amounts of time the three groups of LD students spent engaged in (a) active academic responses (writing, playing academic games, reading aloud, reading silently, talking about academics, answering academic questions, and asking academic questions), (b) task management responses (passive responses, raising hands, looking for materials, moving to new academic stations, and appropriate play), and (c) inappropriate responses (disruption, inappropriate play, inappropriate task, talking about non-academics, inappropriate locale, looking around, and self-stimulation). Differences among the groups were significant for the inappropriate response composite, $F(2,23)=4.85$, $p=.018$. Students in levels 1 and 2 engaged in significantly more inappropriate responses (about 42 min) than students in levels 3-5 (about 15 min).

Insert Table 19 about here

Additional Observation Findings

In addition to the eight major research questions, data for 22 other questions were analyzed. These questions dealt with specific combinations of the 53 events that were observed. For example, one question examined the extent to which there were significant differences in time spent in various student responses as a function of teaching structures by students in different LD service delivery levels. A complete listing of the questions and findings for the comparisons of the five service levels is presented in Appendix E.

Achievement Test Results

The average PIAT standard scores of the students in each service delivery level at the end of the school year are presented in Table 20. As is evident in the table, there was not a clear trend of decreasing scores from level 1 to level 5. Considerable shifting of rank orders of the scores on each subtest occurred for levels 1-3. In general, students in levels 4 and 5 earned lower scores than students in levels 1-3.

Insert Table 20 about here

Correlations between achievement and student responses.

Correlations were computed between students' standard scores on each PIAT subtest and the total test with the time engaged in each student response. Table 21 is a list of the significant correlations found between the PIAT and academic student responses. Both the time a student spent reading aloud and the time a student spent talking about academics were related negatively to end-of-the-year PIAT scores. The time a student was engaged in silent reading and asking academic questions were related positively to achievement.

Insert Table 21 about here

Significant correlations between the PIAT and task management responses are shown in Table 22. All correlations were negative.

Insert Table 22 about here

Correlations between the PIAT and inappropriate student responses are presented in Table 23. All significant correlations were positive, ranging from .40 to .63.

Insert Table 23 about here

Correlations between achievement changes and student responses. Although both pre and post scores were available for 15 students, records indicated that the pre scores for eight students were from PIAT administrations two or more years old. Thus, only the data from the seven students whose pre PIAT scores were obtained approximately one year before the post PIAT scores were included in the present analysis. The average changes in raw scores and the ranges of the changes for these students are shown in Table 24. Mean raw score changes ranged from +4.00 (Spelling) to +9.00 (General Information); the average change in the total score was +20.00. The range of change scores on several of the subtests was quite large.

Insert Table 24 about here

Table 25 is a list of the significant correlations found between changes in students' PIAT scores and time engaged in student responses. Three academic student responses were related significantly to changes in achievement: writing, reading aloud, and asking academic questions. In contrast to the positive correlations for writing and reading aloud, the significant correlations between asking academic questions and achievement gain were negative. One task management student response, play appropriate (teacher-sanctioned play) was related positively to achievement gains. One inappropriate student response, inappropriate locale, was related negatively to achievement gain.

Insert Table 25 about here

Anecdotal Records

Descriptions of the classroom setting and target students were written by the observers, when possible, to document qualitative characteristics that might not be evident from the observational records. Anecdotal records were completed for 24 students; records were not written for two level 3 students. Qualitative data related to the target student's location in the classroom, physical appearance, relationship with the teacher, relationship with peers, and attention to task are summarized here.

Location in classroom. The location of most of the LD students (10 of 24) was in the back of the room. Six students were positioned in the front of the classroom and six were positioned somewhere in the middle of the classroom; the position of one student was described as variable (seating position was changed during the day) and the position of the other was not described. All level 2 students were positioned in the back of the classroom.

Physical appearance. Most students were described by the observers as being average, or similar in appearance to the student's peers. Within each service level, approximately one-third of the students were described as different in some respect (e.g., less neat, chunkier, strange eye movements).

Relationship with teacher. The relationship between the target student and his/her teacher was described relative to the relationship between other students in the classroom and the teacher. For half of the students, the relationship between the target and the teacher was described as similar to that between other students and the teacher. This proportion was similar within each level. However, within level 3, all but one case described as different involved a relationship that was somewhat negative in nature (e.g., student always challenging teacher, teacher calling on student frequently to get student's attention, teacher extra watchful of student). In general, most other different relationships involved the teacher giving extra reinforcement or affection to the target student or the student frequently asking questions.

Relationship with peers. The relationship between the target student and his/her peers was described as average for 18 of the 26 students. Peer relationships described as somewhat atypical occurred in all levels and involved target students who were loud, bullied others, tattled frequently, or who were picked on and received many negative comments from others.

Attention to task. The target student's attention to task was described as variable or poor for 13 of the 26 students. In several cases it was noted that the student's attention to the task was poor unless under close supervision or in individual teaching structures.

Discussion

Educators have argued for many years that instructional approaches for handicapped students should vary as a function of the severity of the students' impairments. Recently, Poplin (1981) chastized researchers and educators in the field of learning disabilities for their failure to recognize this need, and specifically for the lack of attention given to severely learning disabled individuals. However, several states have identified different service delivery levels for handicapped students, apparently in an attempt to vary instructional approaches to meet the needs of students exhibiting varying degrees of impairment. The present study used observational procedures to document the extent to which students in different service delivery levels were provided with varying instructional approaches and opportunities to learn.

Data from the observation of 26 students, each for two entire school days, revealed several differences in instructional approaches. In general, less severely learning disabled students (those in service levels with lower numbers) were allocated more time for academic activities, entire group teaching structures, and no teacher response than were more severely learning disabled students. On the other hand, more severely learning disabled students (those in service levels with higher numbers) were allocated more time for other media instruction (e.g., games and flashcards), individual teaching structures, and teacher approval than were less severely learning disabled students. These differences may be accounted for, in part, by the number of students typically served within the resource room in each service level and the amount of time spent in the resource room by students in different levels. This hypothesis is supported somewhat by the finding that although individual teaching structures were employed an average of 1.4 hours per day for level 4 students, individual structures were employed for only about 15 minutes per day for Level 5 students, who were congregated within special classes made up of about 15 students. However, it also must be noted that even though more severely learning disabled students received more teacher approval time than less severely learning disabled students, teacher approval time averaged only 1.2 minutes per day for level 4 students and 1.7 minutes per day for level 5 students.

In examining students' opportunities to learn as a function of level of service, fewer differences were found. Only one difference was found in the amount of time students were engaged in active academic responses: less severely learning disabled students engaged in silent reading for greater amounts of time (about 12.5 min) than more severely learning disabled students (who spent about 6.0 min). However, less severely disabled students also spent more time engaged in inappropriate student responses (42 vs 22 min), specifically inappropriate play (8 vs 3 min) and looking around (22 vs 10 min), than did more severely disabled students.

As in previous research (Graden, Thurlow, & Ysseldyke, 1982b; Thurlow et al., 1982), a striking finding was the small amount of active academic responding time for all students. Academic responding time averaged about 43 minutes per day, which accounted for only 25% of students' total responding time. On the other hand, task management responses accounted for 55% (95 min) and inappropriate responses accounted for almost 20% (30 min). These percentages are very similar to those found in other areas of the U. S. (cf. Greenwood et al., 1981; Hall et al., undated). Although these average times have been obtained for both regular and LD students and for both urban and suburban school students, the variability among individual students remains great (see Appendix D). Even within service levels, variability in times is extensive. For example, in level 3, one student engaged in reading aloud for 16.4 minutes per day while another spent no time reading aloud. In level 5, where students were in a special classroom all day, reading aloud time ranged from 4.0 minutes to 9.4 minutes per day.

Over the course of a school year (about 160 days), LD students spend approximately 1000 hours in the school building. However, based on the data obtained in this study, it appears that nearly 480 hours of this time are devoted to non-instructional activities such as recess, lunch, and so on, and another 90 hours are allocated to non-academic activities. Students made active academic responses for about 25% of the time they were observed. Over the school year, this would amount to about 125 hours of active academic responding, which seems low in comparison to the approximately 275 hours during which students would be engaged in various task management responses. Further, time engaged in active academic responding would not be much greater than the approximately 100 hours in which the student would be engaged in inappropriate responses. Over the school year, the average amount of time the student engaged in reading aloud would be about 10 hours. This is considerably above the two hours projected for non-LD students (cf. Thurlow et al., 1982), yet still remarkably low.

The importance of the differences in these composite times are confirmed by the relationships that have been found between students' responding times and achievement changes. Within the current study, where the achievement measure was rather global and where data were available only for a limited number of students, both reading aloud and writing were related significantly to achievement gains, and being in an inappropriate locale related negatively to achievement gains. Teacher-sanctioned play, considered to be a task management response, also related positively to achievement. The negative relationship between the active academic response of asking questions and achievement gains might reflect the nature of these students "academic" questions, at least at the elementary level. In several cases, anecdotal records documented the frequency with which students asked questions. Although the average time of one minute per day asking questions is not high, it is nearly twice the average time that has been found for non-LD students (cf. Thurlow et al., 1982), and may reflect time spent in asking non-content related academic questions (e.g., what page should I be reading?). Interestingly, Graden et al. (1982b) found that the amount of time spent asking academic questions was significantly different for students in high and low behavioral groups, with low behavioral group students engaged in asking questions approximately 0.8 minutes per day compared to 0.2 minutes per day for high group students.

A recent survey of LD teachers (DeLoach, Earl, Brown, Poplin, & Warner, 1981) suggested to those conducting the survey that LD teachers are able to differentiate severely learning disabled students from mildly learning disabled students. Characteristics that were believed to differentiate the two groups included the need of severely disabled students for one-to-one instruction and an alternative learning environment and curriculum. Other researchers (Deshler, Alley, Warner, & Schumaker, 1981; Hallahan, Marshall, & Lloyd, 1981) have argued that active involvement in learning is a critical characteristic of effective instructional methods for severely disabled students.

The results of the current study indicate that students in higher service delivery levels do not receive significantly greater opportunities for active academic responding than students in lower service delivery levels. However, the data do not indicate what the students' opportunities for active academic responding would be if they were not being provided with special education services or if they were provided services in lower levels than those to which they were assigned. Although instructional approaches did differ somewhat for the more severely disabled students (more individual teaching, more teacher approval, and greater use of other media), relatively few effects were evident in student responding. The significantly lower amounts of inappropriate responding by students in levels 3 to 5, where students leave the regular classroom or are in a special classroom all day, suggest that increasing special education services does reduce inappropriate responding. Specific hypotheses about the effect of special education services compared to regular class services need to be tested by separating the responses made by students while in the resource room from those responses made by the same students while in the regular classroom. Such analyses will be conducted to address the important issue of how individual students respond in the two settings.

It is interesting to note that trends of increasing individual instruction and teaching were not maintained at level 5, where students were in a special classroom for the entire day. Students placed in this service level apparently were treated more often within groups, whereas students who left the regular classroom daily to be with a resource room teacher were provided greater opportunities for individual instruction. The extent to which lower time allocations to individual instruction and teaching reponses are a function of differences in school systems, urban-suburban communities, or service delivery levels is unknown and perhaps unimportant given the similarity of level 5 students' opportunities to respond actively to those of students in other levels.

The major finding of the present study is that regardless of school system, community, or service delivery level, students receive few opportunities to learn through active academic responding. This situation can be altered by school administrators, parents, teacher trainers, and teachers alike.

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Footnotes

The observational research reported here was part of an extensive project that could not have been completed without the cooperation and help of numerous individuals. Foremost among these were the administrators, teachers, and students in the school district in which the research was conducted. Equally important to the successful completion of the research were the observers; all were committed to providing an accurate, objective picture of the school day. Listed alphabetically, the observers for the present study were: Barbara Flykt, Eileen Mevissen, Donna Miller, Rose Marie Plant, Cheryl Randklev, Judith Rygwall, Yvonne Shafranski, Wendy Studer, and Geraldine Webster. In addition, the assistance of Sandra Christenson during observer training is gratefully acknowledged. The special assistance of Charles Greenwood and Sandra Stanley, University of Kansas, in the implementation of their CISSAR observational system was appreciated greatly, as was the data analysis expertise provided by Bob Algozzine, Matthew McGue, and Jing-Jen Wang. Also essential to the completion of the project were the contributions of psychometric assistants Barbara Anderson, Lisa Boyum, Yetta Levine, and Cathy Walters. Special thanks are due to Cathy Walters for her preparation of the graphics for this report. Further, the excellent secretarial services provided by Audrey Thurlow and Marilyn Hyatt made the entire research process a success.

[1] Throughout this report, "LD" is used to refer to students labeled LD by the schools. Schools use a variety of approaches in

assigning this label.

[2] For each research question, the number of possible significant findings (i.e., the number of variables) was tabulated and then a five percent cutoff point was determined. For example, for the first research question, 11 significant findings were possible; the cutoff point thus was .55. Findings for a given research question were considered to be meaningful only when the number of significant *t* test findings was greater than the five percent cutoff point. Thus, for a research question encompassing 209 variables, the differences indicated by a total of 10 significant *t* tests would not be considered meaningful (the cutoff point would be 10.45), whereas for a research question encompassing 152 variables, the differences indicated by a total of 10 significant *t* tests would be considered meaningful (the cutoff point would be 7.60).

Table 1

CISSAR Event Areas and Specific Events Coded[a]

Event Area	Specific Events Coded
Activity - type of instruction being provided/established by teacher	R - Reading M - Math S - Spelling H - Handwriting L - Language Sc - Science Ss - Social Studies Ac - Arts/Crafts Ft - Free Time Bm - Class Business/ Management Tn - Transition Ct Can't Tell
Task - curriculum task or verbal instruction mode in which student is expected to engage	Rr - Readers Wb - Workbooks Ws - Worksheets Pp - Paper and Pencil Ll - Listen to Teacher Lecture Om - Other Media Tsd - Teacher-Student Discussion Fp - Fetch/Put Away
Teaching Structure - physical arrangement of student in class	Eg - Entire group Sg - Small group I - Individual
Teacher Position - location of teacher	IF - In Front of Class AD - At Desk AS - Among Students O - Out of Room S - Side B - Back
Teacher Activity - response of teacher to target student	NR - No Response T - Teaching OT - Other Talk A - Approval D - Disapproval
Student Response - behavior in which student is engaged	W - Writing G - Playing Academic Game RA - Reading Aloud RS - Silent Reading TA - Talking About Academics ANQ - Answers Academic Question ASK - Asks Academic Question AT - Passive Response RH - Raising Hand LM - Looking for Materials M - Moves to New Academic Station PA - Play Appropriate DI - Disruption PI - Play Inappropriate IT - Inappropriate Task TNA - Talking About Nonacademics IL - Inappropriate Locale LA - Look Around SST - Self-Stimulation

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[a] Based on Stanley & Greenwood's (1980) CISSAR: Code for instructional structure and student academic response: Observer's manual. Within the Student Response Event Area, the AT event, which was designated as "Attending" by Stanley and Greenwood, was renamed as "Passive Response" in the present investigation to avoid inappropriate connotations of the responses included within that event.

Table 2

Summary of Reliabilities Calculated During the Study[a]

Reliability	Mean	Range
Behavioral		
Teacher Position	88.2	62-100
Teacher Activity	92.6	82-100
Student Response	85.5	65-98
Sequential	90.3	74-99

[a] All reliabilities are expressed as percentages.

Table 3

Examples of Observed Events With Large Time Variability Among Students

Event	Range	Time Difference
Activity		
Reading	23.80 - 92.05	68.25
Math	22.05 - 67.20	45.15
Task		
Readers	4.55 -113.05	108.50
Workbooks	0.00 - 92.75	92.75
Other Media	20.30 -104.30	84.00
Structure		
Entire Group	34.30 -227.50	193.20
Small Group	0.00 - 96.95	96.95
Individual	0.00 - 93.45	93.45
Teacher Position		
In Front	10.90 - 95.60	84.70
At Desk	1.15 - 84.10	82.95
Among Students	10.15 -140.90	130.75
Beside Student	1.00 - 66.25	65.25
Teacher Activity		
No Response	52.35 -153.60	101.25
Teaching	23.85 - 96.10	72.25
Student Response		
Writing	9.15 - 37.50	28.35
Passive Response	26.50 -136.40	109.90
Look Around	4.85 - 28.15	23.30

Table 4

Time Allocated to Activities for LD Students in Five Service Levels[a]

Activity	1		2		3		4		5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
Reading	54.6	27.0	50.2	21.6	56.9	26.3	69.9	35.0	52.2	31.0	ns
Math	41.4	20.5	52.7	22.7	40.5	18.7	43.4	21.7	22.8	13.5	.012
Spelling	7.4	3.7	9.9	4.3	13.8	6.4	4.8	2.4	5.5	3.3	ns
Handwriting	11.6	5.7	7.4	3.2	7.5	3.5	7.4	3.7	6.6	3.9	ns
Language	24.6	12.2	21.7	9.3	35.7	16.5	19.0	9.5	39.3	23.3	ns
Science	1.5	0.7	20.6	8.9	12.2	5.6	7.6	3.8	2.9	1.7	ns
Social Studies	17.6	8.7	27.6	11.9	19.6	9.1	13.1	6.6	4.4	2.6	ns
Arts/Crafts	18.1	9.0	16.9	7.3	7.9	3.6	18.3	9.2	13.1	7.8	ns
Free Time	9.3	4.6	4.4	1.9	5.0	2.3	5.6	2.8	5.8	3.4	ns
Business Management	4.0	2.0	6.9	3.0	6.2	2.9	4.3	2.2	5.8	3.4	ns
Transition	11.7	5.8	14.0	6.0	10.7	4.9	6.3	3.2	9.4	5.6	ns
Can't Tell	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.6	0.4	ns
Total	201.8		232.3		216.2		199.7		168.4		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 3 students each in Levels 1, 2, 4, and 5 and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=4,21).

Table 5

Composite Activity Times for LD Students in Five Service Levels[a]

Activity Composite	1		2		3		4		5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
Academic	158.7	78.6	190.1	81.8	186.2	86.1	165.2	82.7	133.7	79.4	.005
Non-Academic	43.1	21.4	42.2	18.2	30.0	13.9	34.5	17.3	34.7	20.6	ns
Total	201.8		232.3		216.2		199.7		168.4		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 3 students each in Levels 1, 2, 4, and 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df = 4,21).

Table 6

Time Allocated to Tasks for LD Students in Five Service Levels[a]

	1		2		3		4		5		
Task	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	Sig Level[b]
Readers	69.2	34.4	53.3	22.9	59.8	27.7	35.2	17.5	18.4	11.0	ns
Workbooks	22.5	11.2	48.9	21.0	31.8	14.7	22.6	11.2	9.6	5.7	ns
Worksheets	23.6	11.7	34.6	14.9	30.4	14.1	40.8	20.3	28.1	16.8	ns
Paper & Pencil	21.5	10.7	8.9	3.8	21.7	10.0	8.2	4.1	20.9	12.5	ns
Listen to Lecture	2.0	1.0	11.4	4.9	2.8	1.3	2.6	1.3	6.6	3.9	.038
Other Media	39.0	19.4	38.7	16.6	44.0	20.4	75.4	37.5	57.4	34.3	ns
Teacher-Student Discussion	3.6	1.8	19.7	8.5	12.2	5.6	9.1	4.5	15.8	9.4	ns
Fetch & Put Away	20.0	9.9	17.0	7.3	13.2	6.1	7.0	3.5	10.6	6.3	ns
Total	201.4		232.5		215.9		200.9		167.4		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 3 students each in Levels 1, 2, 4, and 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=4,21).

Table 7

Time Allocated to Teaching Structures for LD Students in Five Service Levels[a]

Structure	1		2		3		4		5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
Entire Group	128.2	63.5	181.6	78.2	152.6	70.4	56.7	28.2	86.6	51.4	.001
Small Group	59.0	29.2	26.2	11.3	34.4	15.9	57.2	28.5	66.3	39.4	ns
Individual	14.6	7.2	24.5	10.5	29.8	13.7	86.8	43.2	15.4	9.2	.002
Total	201.8		232.3		216.8		200.7		168.3		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 3 students each in Levels 1, 2, 4, and 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=4,21).

Table 8

Time in Various Teacher Positions for LD Students in Five Service Levels[a]

Teacher Position	1		2		3		4		5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
In Front	31.1	18.6	62.4	32.2	32.0	17.8	27.1	16.3	21.7	15.6	ns
At Desk	41.4	24.7	34.7	17.9	31.3	17.4	12.4	7.4	9.3	6.7	ns
Among Students	69.7	41.6	67.4	34.8	87.7	48.7	76.2	45.8	80.8	58.1	ns
Beside Student	7.6	4.5	16.2	8.4	19.3	10.7	41.3	24.8	13.8	9.9	ns
Back	3.9	2.3	10.5	5.4	4.9	2.7	6.7	4.0	7.8	5.6	ns
Out	13.7	8.2	2.3	1.2	4.9	2.7	2.8	1.7	5.6	4.0	ns
Total	167.4		193.5		180.1		166.5		139.0		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 3 students each in Levels 1, 2, 4, and 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=4,21).

Table 9

Time in Various Teacher Activities for LD Students in Five Service Levels[a]

Teacher Activity	1		2		3		4		5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
No Response	119.2	71.1	119.7	61.8	107.9	60.0	87.4	52.5	89.1	64.1	ns
Teaching	43.7	26.0	64.7	33.4	64.7	36.0	67.4	40.5	42.6	30.7	ns
Other Talk	3.9	2.3	7.7	4.0	5.6	3.1	9.1	5.5	4.8	3.4	ns
Approval	0.4	0.2	0.1	0.1	0.5	0.3	1.2	0.7	1.7	1.2	.038
Disapproval	0.5	0.3	1.4	0.7	1.2	0.7	1.4	0.8	0.7	0.5	ns
Total	167.7		193.6		179.9		166.5		138.9		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 3 students each in Levels 1, 2, 4, and 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=4,21).

Table 10

Student Response Time for LD Students in Five Service Levels[a]

Student Response	1		2		3		4		5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
Writing	23.8	14.2	16.8	8.7	23.5	13.1	20.1	12.1	21.2	15.3	ns
Play Acad Game	1.3	0.8	0.5	0.2	3.5	1.9	3.8	2.3	1.6	1.2	ns
Read Aloud	1.3	0.8	1.0	0.5	5.0	2.8	3.9	2.3	6.2	4.5	ns
Read Silently	12.0	7.2	13.1	6.8	7.1	4.0	3.8	2.3	2.4	1.7	ns
Talk Academics	1.8	1.1	4.6	2.4	5.7	3.2	9.2	5.5	4.3	3.1	ns
Answer Acad Question	0.5	0.3	1.4	0.7	1.9	1.0	3.8	2.3	0.8	0.6	ns
Ask Acad Question	0.7	0.4	1.1	0.6	0.9	0.5	1.4	0.8	0.6	0.4	ns
Passive Response	60.4	36.1	79.5	41.0	79.8	44.4	63.0	37.9	64.7	46.7	ns
Raise Hand	2.2	1.3	3.3	1.7	2.8	1.6	3.8	2.3	1.7	1.2	ns
Look for Materials	6.4	3.8	7.8	4.0	4.9	2.7	9.8	5.9	3.1	2.2	ns
Move to New Acad Station	5.1	3.0	6.7	3.4	5.8	3.2	5.7	3.4	4.9	3.5	ns
Play Appropriate	14.6	8.7	11.9	6.1	9.6	5.3	9.1	5.5	11.4	8.2	ns
Disruption	0.3	0.2	2.4	1.2	0.2	0.1	4.6	2.8	0.2	0.1	ns
Play Inappropriate	6.3	3.8	10.3	5.3	4.1	2.3	3.7	2.2	2.1	1.5	ns
Inappropriate Task	0.7	0.4	1.1	0.6	0.8	0.4	2.3	1.4	0.0	0.0	ns
Talk Non-Academics	4.2	2.5	8.8	4.5	5.4	3.0	7.3	4.4	3.5	2.5	ns
Inappropriate Locale	1.0	0.6	3.1	1.6	2.5	1.4	1.4	0.8	0.1	0.1	ns
Look Around	24.3	14.5	20.0	10.3	15.6	8.7	9.6	5.8	9.7	7.0	.019
Self Stimulation	0.4	0.2	0.5	0.2	0.4	0.2	0.2	0.1	0.1	0.1	ns
Total	167.3		193.9		179.7		166.4		138.6		ns

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[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 3 students each in Levels 1, 2, 4, and 5 and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=4,21).

Table 11

Composite Student Response Times for LD Students in Five Service Levels[a]

Student Response Composite	1		2		3		4		5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
Academic	41.4	24.7	38.5	19.8	47.6	26.5	45.9	27.6	37.1	26.8	ns
Task Management	88.7	53.0	109.2	56.3	102.9	57.3	91.4	54.9	85.8	61.9	ns
Inappropriate	37.2	22.2	46.2	23.8	29.2	16.2	29.1	17.5	15.7	11.3	.026
Total	167.3		193.9		179.7		166.4		138.6		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 3 students each in Levels 1, 2, 4, and 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=4,21).

Table 12

Time Allocated to Activities for LD Students in Three Groups[a]

	1 & 2		3		4 & 5		
Activity	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	Sig Level[b]
Reading	52.4	24.1	56.9	26.3	61.0	30.6	ns
Math	47.1	21.7	40.5	18.7	33.1	16.6	ns
Spelling	8.6	4.0	13.8	6.4	20.5	10.3	ns
Handwriting	9.4	4.3	7.5	3.5	7.0	3.5	ns
Language	23.2	10.7	35.7	16.5	29.2	14.6	ns
Science	11.1	5.1	12.2	5.6	5.2	2.6	ns
Social Studies	22.6	10.4	19.6	9.1	8.8	4.4	ns
Arts/Crafts	17.5	8.1	7.9	3.6	15.7	7.9	ns
Free Time	6.9	3.2	5.0	2.3	5.7	2.8	ns
Business Mgmt	5.4	2.5	6.2	2.9	5.1	2.6	ns
Transition	12.8	5.9	10.7	4.9	7.9	4.0	ns
Can't Tell	0.0	0.0	0.2	0.1	0.3	0.2	ns
Total	217.0		216.2		199.5		ns

[a] Entries are mean numbers of minutes and percentages of total minutes, for one day, based on 6 students in Levels 1 and 2 and 4 & 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=2,23).

Table 13

Composite Activity Times for LD Students in Three Groups[a]

Activity	1 & 2		3		4 & 5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
Academic	174.4	80.4	186.2	86.1	164.8	82.6	.011
Non-Academic	42.6	19.6	30.0	13.9	34.7	17.4	ns
Total	217.0		216.2		199.5		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 6 students in Levels 1 & 2 and 4 & 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=2,23).

Table 14

Time Allocated to Tasks for LD Students in Three Groups[a]

Task	1 & 2		3		4 & 5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
Readers	61.2	28.2	59.8	27.7	26.8	14.6	.028
Workbooks	35.7	16.4	31.8	14.7	16.1	8.7	ns
Worksheets	29.1	13.4	30.4	14.1	34.5	18.7	ns
Paper & Pencil	15.2	7.0	21.7	10.0	14.5	7.9	ns
Listen to Lecture	6.7	3.1	2.8	1.3	4.6	2.5	ns
Other Media	38.8	17.9	44.0	20.4	66.4	36.1	.027
Teacher-Student Discussion	11.7	5.4	12.2	5.6	12.4	6.7	ns
Fetch & Put Away	18.5	8.5	13.2	6.1	8.8	4.8	ns
Total	216.9		215.9		184.1		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 6 students in Levels 1 & 2 and 4 & 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=2,23).

Table 15

Time Allocated to Teaching Structures for LD Students in Three Groups[a]

Structure	1 & 2		3		4 & 5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
Entire Group	154.9	71.4	152.6	70.4	71.6	38.9	.001
Small Group	42.6	19.6	34.4	15.9	61.7	33.4	ns
Individual	19.5	9.0	29.8	13.7	51.2	27.8	ns
Total	217.0		216.8		184.5		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 6 students in Levels 1 & 2 and 4 & 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=2,23).

Table 16

Time in Various Teacher Positions for LD Students in Three Groups[a]

Teacher Position	1 & 2		3		4 & 5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
In Front	46.7	25.9	32.0	17.8	24.4	16.0	ns
At Desk	38.1	21.1	31.3	17.4	10.8	7.1	ns
Among Students	68.6	38.0	87.7	48.7	78.5	51.4	ns
Beside Student	11.9	6.6	19.3	10.7	27.5	18.0	ns
Back	7.2	4.0	4.9	2.7	7.2	4.7	ns
Out	8.0	4.4	4.9	2.7	4.2	2.8	ns
Total	180.5		180.1		152.6		ns

[a] Entries are mean numbers of minutes, and percentage of total minutes, for one day, based on 6 students in Levels 1 & 2 and 4 & 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=2,23).

Table 17

Time in Various Teacher Activities for LD Students in Three Groups[a]

Teacher Activity	1 & 2		3		4 & 5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
No Response	119.4	66.1	107.9	60.0	88.3	57.8	.042
Teaching	54.2	30.0	64.7	36.0	55.0	36.0	ns
Other Talk	5.8	3.2	5.6	3.1	7.0	4.6	ns
Approval	0.2	0.1	0.5	0.3	1.4	0.9	.009
Disapproval	1.0	0.6	1.2	0.7	1.0	0.6	ns
Total	180.6		179.9		152.7		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 6 students in Levels 1 & 2 and 4 & 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=2,23).

Table 18

Student Response Times for LD Students in Three Groups[a]

Student Response	1 & 2		3		4 & 5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
Writing	20.3	11.3	23.5	13.1	20.6	13.5	ns
Play Acad Game	0.9	0.5	3.5	1.9	2.7	1.8	ns
Read Aloud	1.0	0.6	5.0	2.8	5.1	3.3	ns
Read Silently	12.5	6.9	7.1	4.0	3.1	2.0	.012
Talk Acad	3.2	1.8	5.7	3.2	6.8	4.5	ns
Answer Acad Q	0.9	0.5	1.9	1.0	2.3	1.5	ns
Ask Acad Q	0.9	0.5	0.9	0.5	1.0	0.6	ns
Passive Response	70.0	38.9	79.8	44.4	63.8	41.9	ns
Raise Hand	2.7	1.5	2.8	1.6	2.8	1.8	ns
Look for Materials	7.1	3.9	4.9	2.7	6.4	4.2	ns
Move	5.9	3.3	5.8	3.2	5.3	3.5	ns
Play Appropriate	13.0	7.2	9.6	5.3	10.2	6.7	ns
Disruption	1.4	0.8	0.2	0.1	2.4	1.6	ns
Play Inappr	8.3	4.6	4.1	2.3	2.9	1.9	.041
Inappr Task	0.9	0.5	0.8	0.4	1.2	0.8	ns
Talk Non-Acad	6.5	3.6	5.4	3.0	5.4	3.5	ns
Inappr Locale	2.0	1.1	2.5	1.4	0.7	0.4	ns
Look Around	22.2	12.3	15.6	8.7	9.6	6.3	.003
Self Stimulation	0.4	0.2	0.4	0.2	0.1	0.1	ns
Total	180.1		179.7		152.4		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 6 students in Levels 1 & 2 and 4 & 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=2,23).

Table 19

Composite Student Response Times for LD Students in Three Groups[a]

Student Response Composite	1 & 2		3		4 & 5		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	$\bar{X}$	%	
Academic	39.7	22.0	47.6	26.5	41.6	27.3	ns
Task Management	98.7	54.8	102.9	57.3	88.5	58.1	ns
Inappropriate	41.7	23.2	29.2	16.2	22.3	14.6	.018
Total	180.1		179.7		152.4		ns

[a] Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 6 students in Levels 1 & 2 and 4 & 5, and 14 students in Level 3.

[b] Significance levels are from one-way ANOVAs (df=2,23).

Table 20

Mean End-of-the-Year PIAT Standard Scores for LD Students in Five Service Levels

Subtest	1[a]	2[b]	3[c]	4[d]	5[c]
Math	98.00	89.50	97.18	95.00	85.00
Reading Recognition	95.00	101.50	94.45	81.67	86.67
Reading Comprehension	95.00	101.00	98.09	78.33	80.33
Spelling	109.00	88.00	88.56	82.00	80.33
Information	93.00	113.50	101.27	107.67	88.00
Total	97.00	99.50	95.44	90.33	80.67

[a] Scores were available for 1 student.

[b] Scores were available for 2 students.

[c] Scores were available for 11 students.

[d] Scores were available for 3 students.

[e] Scores were available for 3 students.

Table 21

Significant Correlations Between PIAT and Academic Student Responses

Academic Student Response	PIAT Subtest	r	p
Read Aloud	Spelling	-.48	.021
	Total	-.55	.009
Read Silently	Read Recog	.71	.001
	Read Comp	.61	.002
	Spelling	.60	.004
	Total	.62	.003
Talk Academic	Read Recog	-.46	.021
	Read Comp	-.45	.023
Ask Acad Q	Gen Info	.58	.004

Table 22

Significant Correlations Between PIAT and Task Management Student Responses

Task Management Student Response	PIAT Subtest	r	p
Look for Materials	Read Recog	-.54	.007
	Read Comp	-.53	.008
Move	Math	-.42	.032
Play Appropriate	Spelling	-.47	.025

Table 23

Significant Correlations Between PIAT and Inappropriate Student Responses

Inappropriate Student Response	PIAT Subtest	r	p
Inappr Composite	Read Recog	.40	.040
	Spelling	.43	.037
	Gen Infor	.55	.006
	Total	.63	.002
Disruption	Gen Infor	.53	.008
	Total	.44	.033
Play Inappr	Gen Infor	.55	.006
	Total	.42	.042
Talk Non-Acad	Gen Infor	.57	.004
	Total	.44	.035
Look Around	Total	.40	.049

Table 24

Changes in PIAT Raw Scores Over One Year for Seven LD Students

PIAT Subtest	$\bar{X}$	Range
Mathematics	4.71	-3 - +18
Reading Recognition	4.57	+1 - +10
Reading Comprehension	4.43	-5 - +18
Spelling	4.00	-4 - +11
General Information	9.00	-2 - +17
Total	20.00	+2 - +43

Table 25

Significant Correlations Between PIAT Raw Score Changes and Student Responses for Seven LD Students

Student Response	PIAT Subtest	r	p
Academic			
Writing	Math	.81	.013
	Read Recog	.73	.032
	Read Comp	.68	.047
Read Aloud	Math	.83	.010
	Read Comp	.74	.029
Ask Acad Q	Math	-.90	.003
	Read Recog	-.73	.030
	Read Comp	-.84	.009
	Spelling	-.93	.003
Task Management			
Play Appropriate	Read Comp	.77	.021
	Gen Infor	.70	.040
Inappropriate			
Inappr Locale	Math	-.73	.030

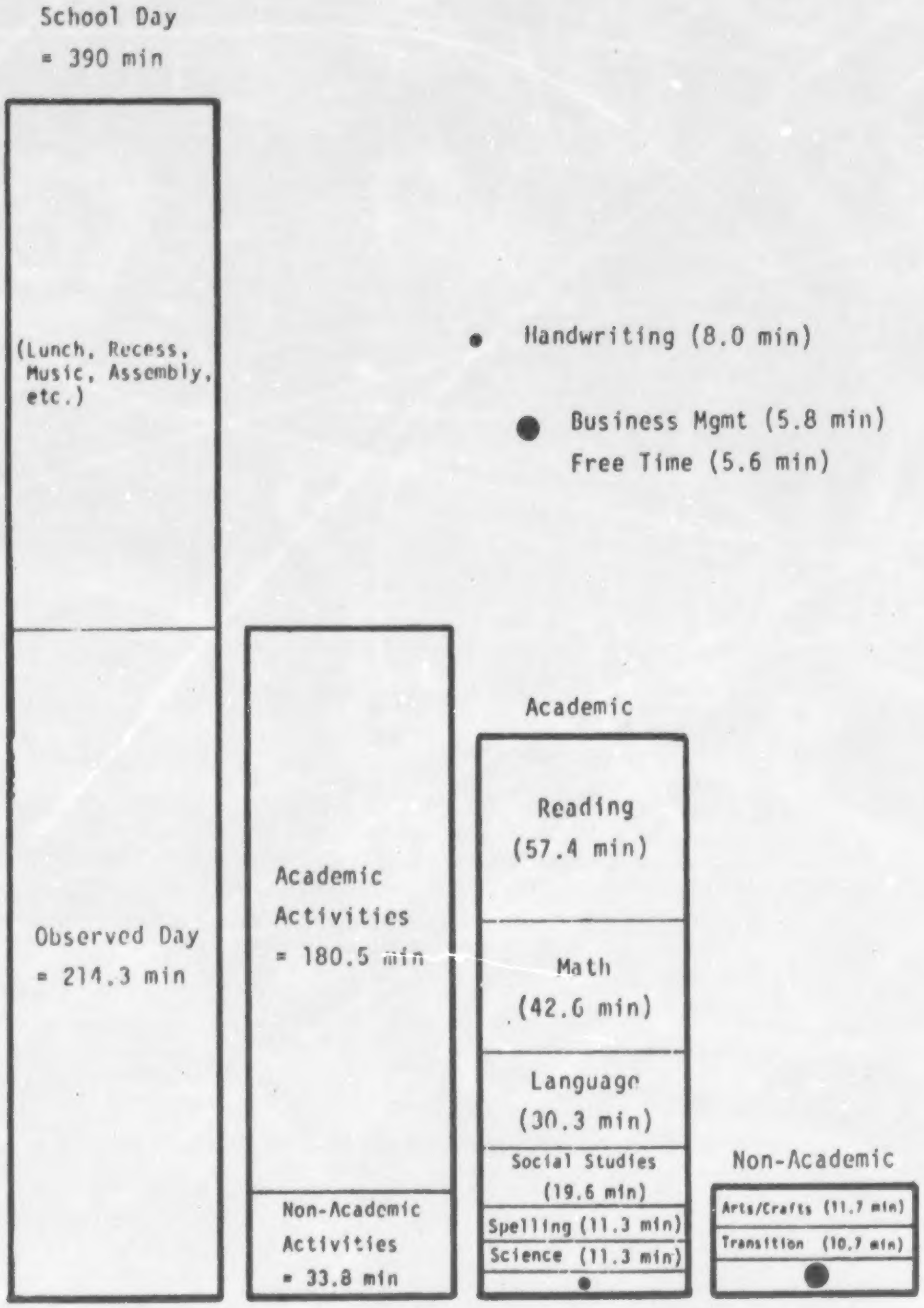

Figure 1. Average Times Allocated to Various Activities During a Typical School Day for Students in Levels 1-4.

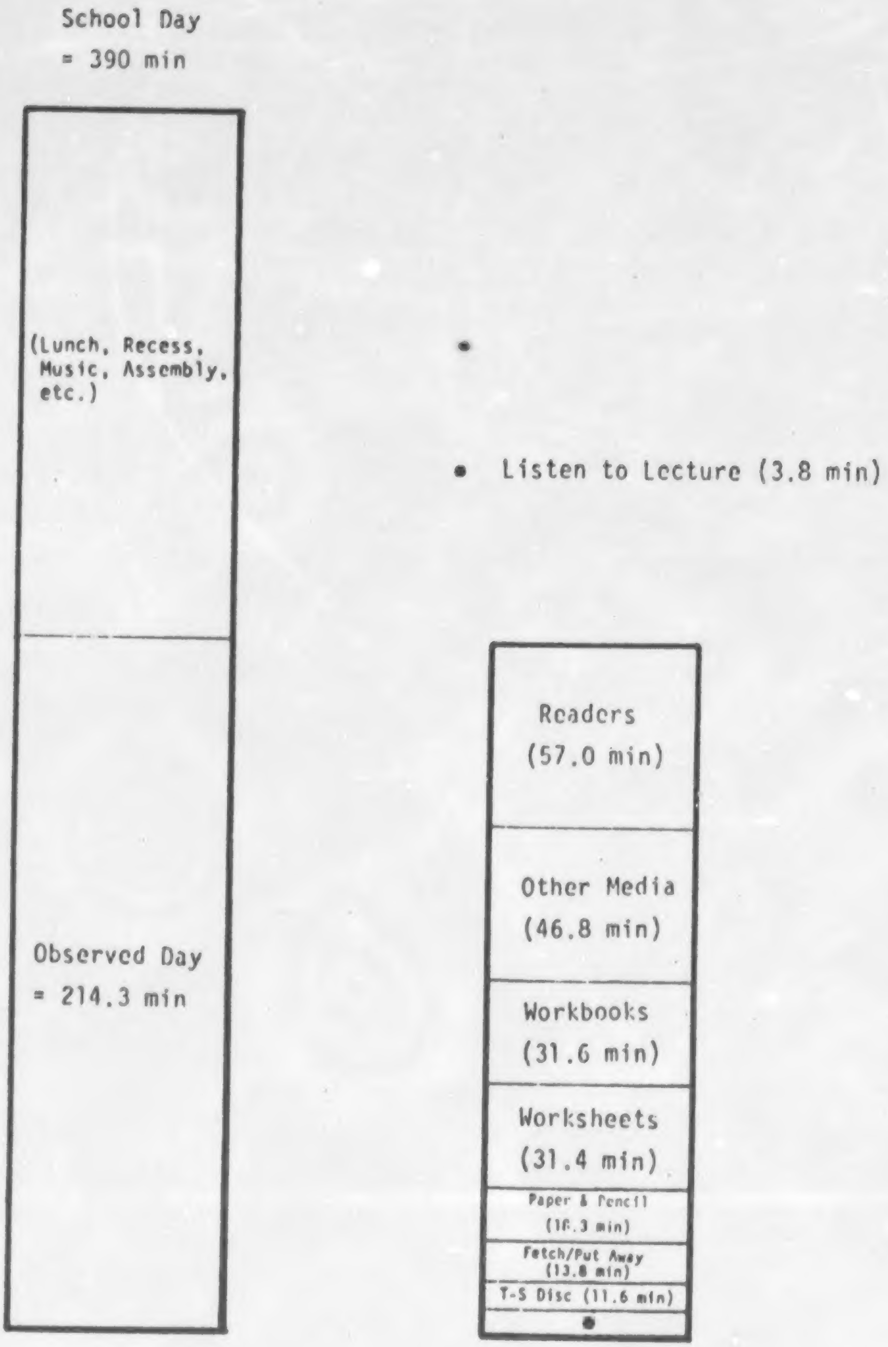

Figure 2. Average Times Allocated to Various Tasks During a Typical School Day for Students in Levels 1-4.

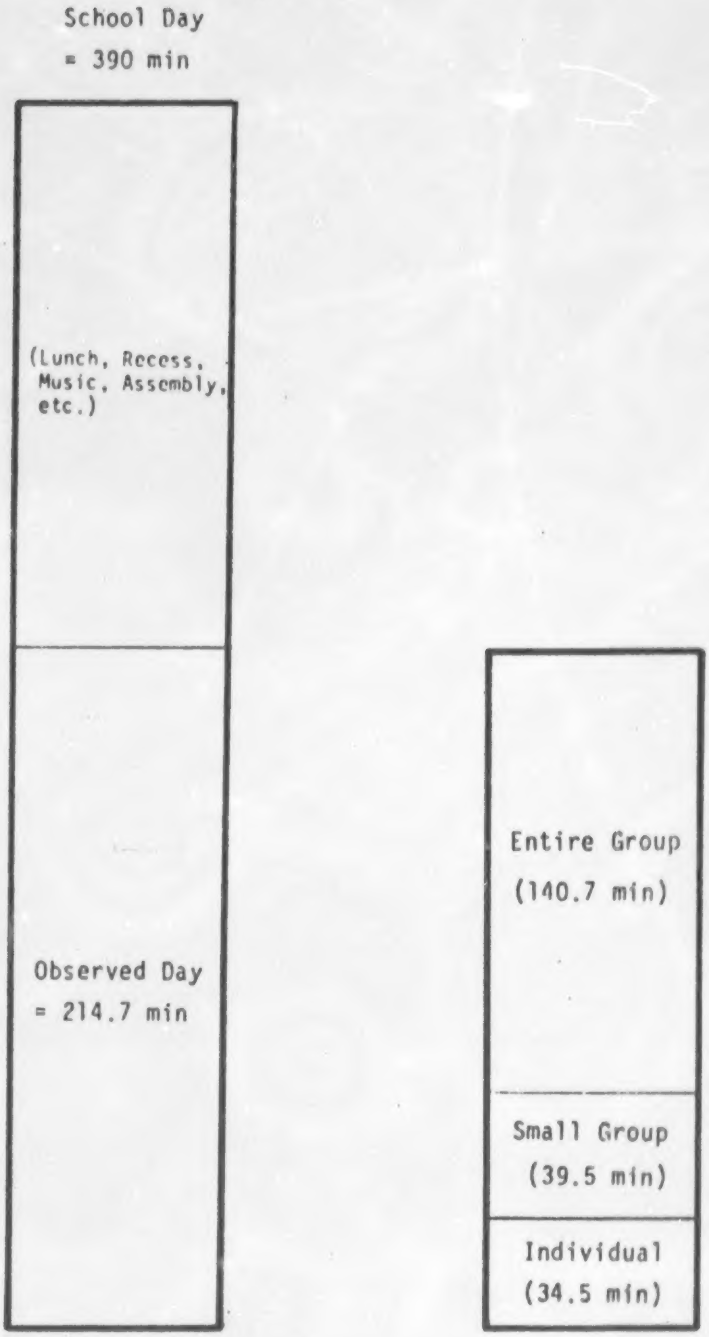

Figure 3. Average Times Allocated to Various Teaching Structures During a Typical School Day for Students in Levels 1-4.

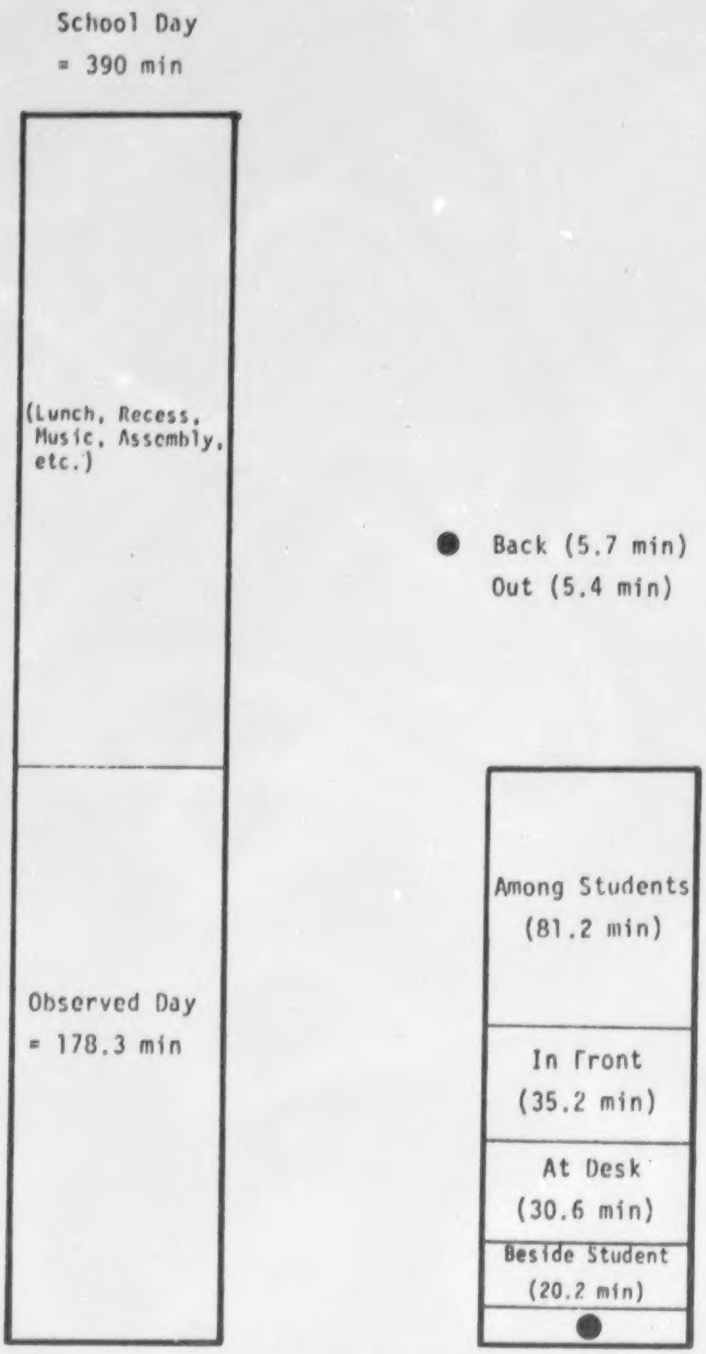

Figure 4. Average Times Allocated to Various Teacher Positions During a Typical School Day for Students in Levels 1-4.

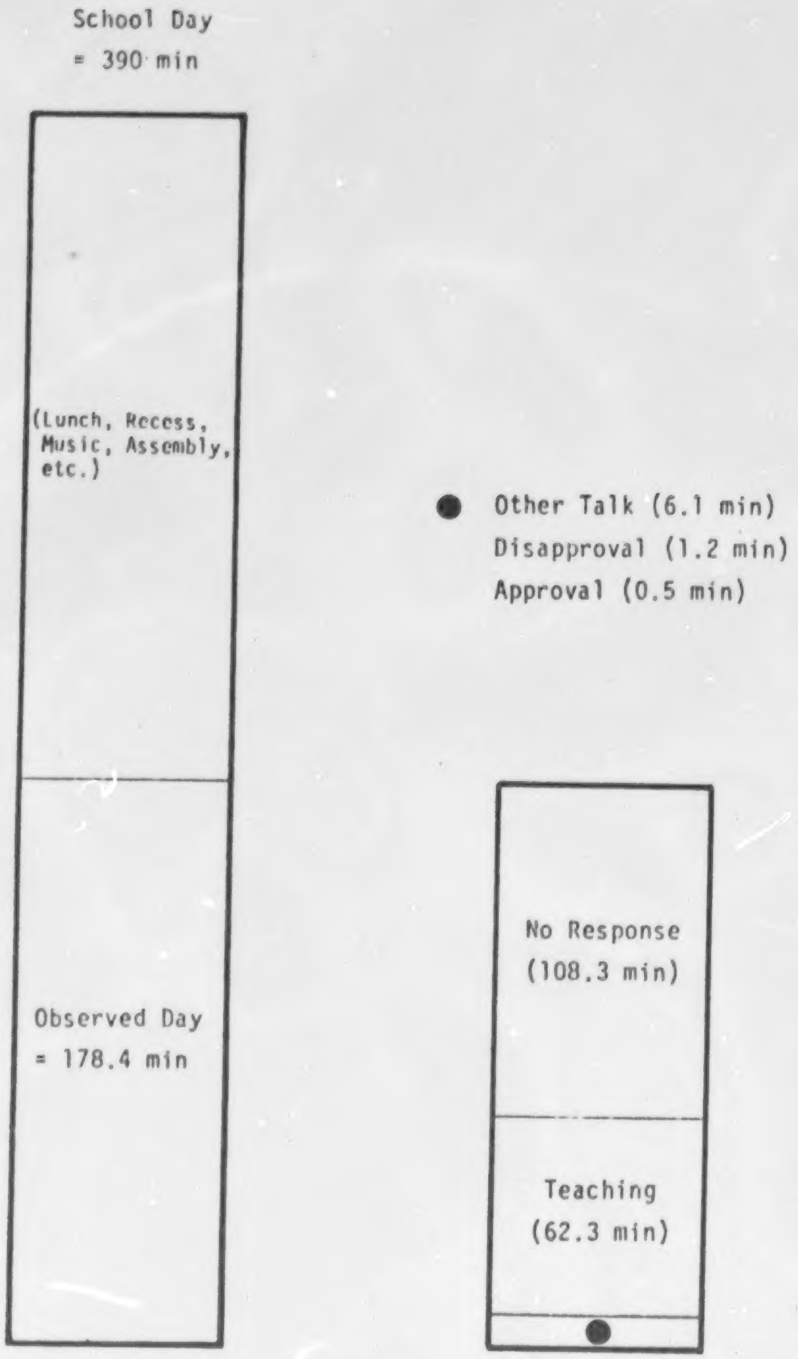

Figure 5. Average Times Allocated to Various Teacher Activities During a Typical School Day for Students in Levels 1-4.

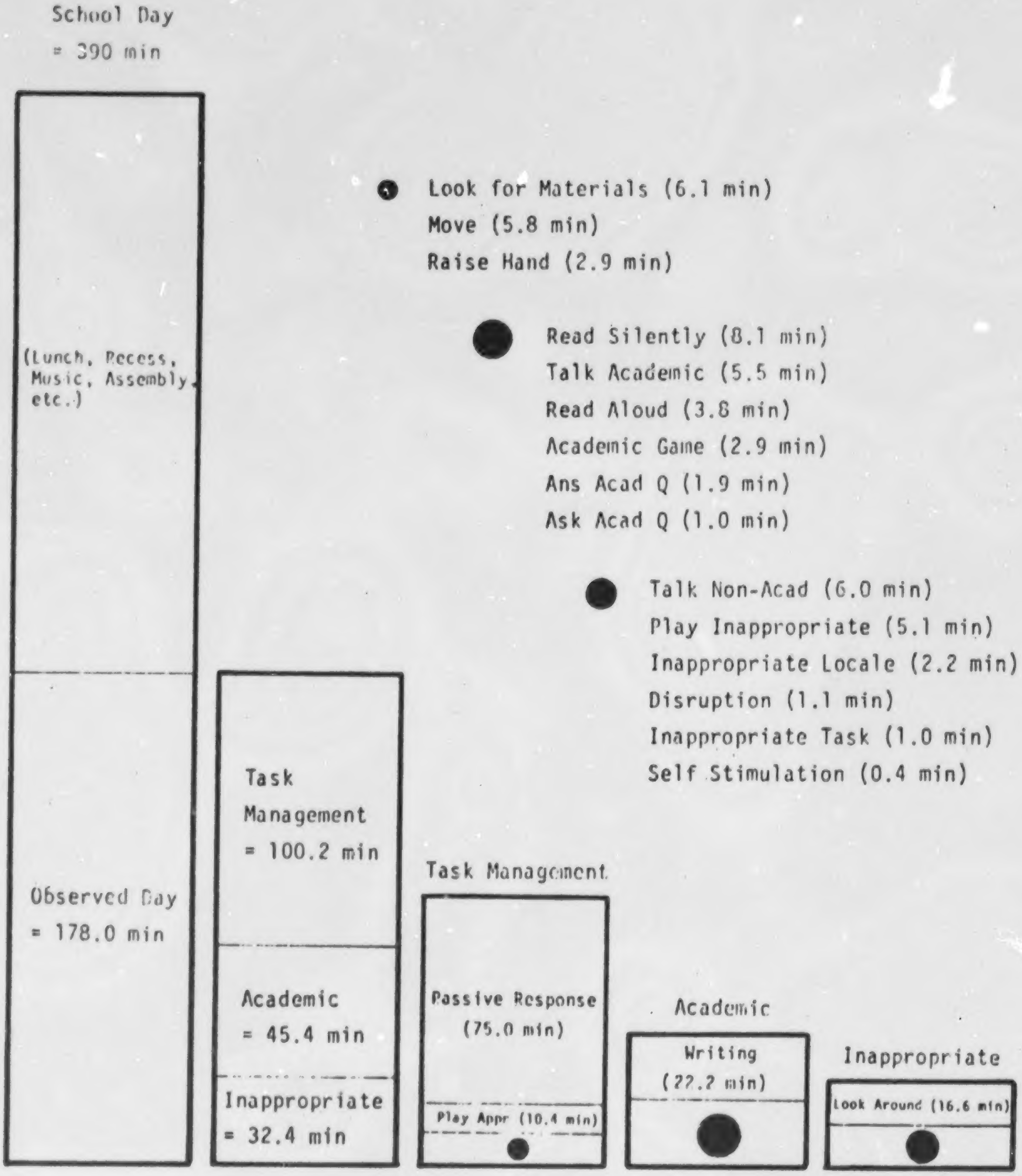

Figure 6. Average Amounts of Times Students in Levels 1-4 Were Engaged in Various Responses During a Typical School Day.

APPENDIX A

Definitions and Examples of CISSAR Events

Instructional Activity

(Subject area of learning experience being provided to target student by teacher, aide, or peer tutor or by target student to tutee.)

Note: Anytime the activity changes, move to a new coding block

Activity/Code	Definition	Examples	Special Notes
Reading (R)	Reading instructions or activity; oral and silent reading from books, discussion of words, sounds, vowels, consonants, phonics	reading library book talking about ch sound sitting at reading table draw picture about story	Include: • how to use dictionary, encyclopedia,...(reference books) • learning ABC's (but, not when learning how to write) • draw picture of what read; act out story
Math (M)	Math instructions or activity; numbers, geometry, time, weights, metrics, measurement, story problems	working time worksheet measuring each other's height writing math problem on board finds examples of "less than" find number of days in 2 years	
Spelling (S)	Spelling instruction or activity; copying spelling work, spelling test	taking spelling test playing spelling bee game looking up correct spelling of missed word	Include: • use of dictionary to find spelling of word
Handwriting (H)	Handwriting instruction or activity; focus on mechanics of writing letters or words (print, cursive, etc.); how to hold pencil, how to move arm, discussion of size of letters, lines on paper	practice penmanship matches capital and lower case letters	

Instructional Activity - cont.

Activity	Definition	Examples	Special Notes
Language (L)	Language instruction or activity; focus on speech, vocabulary, and language meaning (words, physical relationships, etc.); creative writing; listening exercises; other languages	writing book report on story in reader points to "on top," "under," etc. learns how to say "thank you" in 5 languages	Include: • book reports (writing or reading) • looking up definition in dictionary • public speaking exercises
Science (Sc)	Science instruction or activity; science-related topics (chemistry, electricity, space travel, electronics, nature, insects, weather, mammals, body, exercise, personal hygiene)	discuss weather perform experimentation on electricity school nurse talks about hygiene reads Weekly Reader article about insects	Include: • watching or doing experiment • exercises in classroom • sex education (physical aspects-not relationships) • speakers on drugs/alcohol • science article in Weekly Reader
Social Studies (Ss)	Social studies instruction or activity; cultures, ways of life, jobs, roles; maps; music topics (instruments, singing, scales, notes)	talk about sex biases sing Thanksgiving songs label map of U.S. listen to lecture on Civil War	Include: • sex education - relationships in general • unit on friendships • special education topics - relations with handicapped • customs; holidays • history
Arts/Crafts (Ac)	Art-related instruction or activity; coloring, drawing, cutting, pasting	make poster of primary colors draw picture of self watch slides of sculptures	Include: • viewing art (own or others) • decorating (bulletin board, classroom) Within Ac time, putting away or getting new materials is still Ac; only change to Tn at beginning or end of Ac time.

Instructional Activity - cont.

Activity	Definition	Examples	Special Notes
Free Time (Ft)	Period during which student may choose activity - can be academic; study time	works math when told to do anything wants to do after student finishes assignment, is in library area reading	Include: • extra-credit work If everyone has free time, but target student is told what he/she must do, do not code Ft. Code the subject area which he is required to do.
Class Business/ Management (Bm)	Activity focused on scheduling, discipline, rules; usually occurs regularly at start of day; show and tell	picks up lunch tickets class talks about fight on playground during recess say "here" during attendance check	Include: • Pledge of Allegiance, morning songs • sex, relationships, drugs, etc. when related to specific problem in school • taking attendence
Transition (Tn)	Time between two other activities; teacher signals end of one (put away) and time to prepare for new activity. Ends when teacher starts instruction in new activity	class breaks into groups line up to go to recess put away readers and get out math books	For arts/crafts, Tn is coded only before and after entire activity
Can't Tell (CT)	Activities that do not seem to fit in other categories. See coordinator to discuss - must change to another code.		Make note of activity on separate sheet so will remember events to discuss with coordinator

Academic Task

(Materials used by target student for instructional activity)

Note: Any time the task changes, move to a new coding block

Task/Code	Definition	Examples	Special Notes
Readers (Rr)	Printed book, bound material	library book math textbook comic book	Include: • magazines, Weekly Reader • reference books (dictionary, encyclopedia)
Workbooks (Wb)	Paperback material in which student could write (even if student is required by teacher to write on separate paper or in notebook)	spelling workbook language workbook handwriting workbook	
Worksheets (Ws)	Separate prepared teacher sheets (usually ditto or photocopy) on which students write; blackboard writing by student	student practices letters on blackboard dittoed crossword puzzle	Include: • 1 page torn from workbook • writing Weekly Reader exercise • teacher made or printed tests
Paper and Pencil (Pp)	Tasks where student writes on paper using pencil, pen, crayon, etc.; includes writing in notebook	piece of notebook paper for spelling test	If students are taking notes during teacher lecture to remember points, code Ll
Listen to Teacher Lecture (Ll)	Teacher talking or writing on board, and student expected to look and listen	watches teacher demonstrate exercises listens to teacher talk about telling time takes notes as teacher presents ideas for field field trip	Code Ll even if student is taking notes

Academic Task - cont.

Task/Code	Definition	Examples	Special Notes
Other Media (Om)	Special materials; film, tape recorder, game, arts and crafts materials, clocks, telephone, play/drama	watches movie listens to tape recorder works on calculator acts out story part	Include: • calculator • animals
Teacher-student Discussion (Tsd)	Student talking with teacher; ask-answer question All other tasks take precedence	student answers teacher question students in class talk with teacher about friends student tutors another on ABC's student reads book report to class	Include: • peer tutoring unless using other materials • student verbal presentations (including reading book report) All other tasks take precedence over Tsd. Take cue from teacher for change from L1 to Tsd.
Fetch/Put away (Fp)	Students changing materials-putting away and getting, cleaning up	line up for lunch picks up materials to throw away before completing art project student hands out worksheets	When student has absolutely no materials, and is not supposed to have any materials (such as when has free time), code Fp.

Structure

(How student is grouped for instructional activity)

Note: Any time the structure changes, move to a new coding block

Structure/Code	Definition	Examples	Special Notes
Entire Group (Eg)	Student receiving instruction with all other students in classroom	class lecture class freetime	For Eg, teaching (or free time is for everyone) Number is not the criterion - if class has 5 students and instruction is directed to all of them, code Eg
Small Group (Sg)	Student is in part of class that has been separated from rest	reading group discussion group students in pairs	Include: • two students working together away from rest of class
Individual (I)	Student is alone (in corral, at table) or working one-to-one with teacher or aide	student working on science experiment alone while other read from text aide tutors student	Does not occur during free time except when free time was created especially for student

Teacher Position

(Place of teacher in relation to all students)

Teacher Position/ Code	Definition	Examples	Special Notes
In Front/IF	in front of majority of students	- standing at blackboard - at front bulletin board	
At Desk/AD	standing or seated at teacher's desk	- looking in desk for notebook - at desk collecting lunch money	
Among Students/AS	standing or seated among students	- walking around class checking student work - seated with reading group	
Side/S	standing to the side of students and not AS	- student leaning over child's desk - talking to student at his desk	- working individually with a student
Back/B	standing or sitting in back of classroom away from majority of students	- working at isolated desk in back of room -putting up art pictures on back bulletin board	
Out of Room/O	out of the room	- in hall talking to parent - in teacher's lounge	

Teacher Activity

(Coded in relation to target student or group in which he is a member)

Teacher Behavior/ Code	Definition	Examples	Special Notes
No Response/NR	makes no observable response	- at desk grading papers - out of room	- working individually with another student
Teaching/T	instruction or giving a lesson to students child must have opportunity to learn	- explaining at blackboard - asking question - talking about academics, e.g. giving directions	- key is active involvement by teacher
Other Talk/OT	- talking about class business, rules, schedules, future activities - all teacher talk that is not approval, disapproval, or teaching	- talking about recess - talking about mother's hospital stay - collecting lunch money	
Approval/A	expresses praise for student work or conduct	- teacher hugs student - teacher smiles - "Your map looks great"	- includes verbal comments, gestures, physical behaviors
Disapproval/D	expresses dislike or disgust with student work, appearance or conduct	- frowns at student - that is the wrong answer - "You're not trying"	- includes verbal comments, gestures, and physical behaviors

Student Response

(Academic response, task management, or inappropriate behavior of target student)

Student Response/ Code	Definition	Examples	Special Notes
Academic Responses	student responses made to academic task		
Writing/W	students observed marking academic materials with pen, pencil, crayon	- erasing - marks answers on ditto sheet with crayon - completes math problems from workbook	- does not include drawing pictures, scribbling - used for tests
Academic Game/G	engaged with an academic media task played individually or with peer	- includes flashcards, word games, coloring, abacus - student responses are verbal, manipulatory or social in nature - 4 students are playing a spelling game	- includes calculator - flashcards when with a classmate or as a practice tool
Read Aloud/RA	when student looking at reading material and saying aloud what is written in print	- student reads a paragraph to rest of reading group -reads a sentence aloud to "sound out" unfamiliar words	- used when teacher checks student's knowledge of flashcard

Student Response continued

Student Response/ Code	Definition	Examples	Special Notes
Reading Silent/RS	looking at reading material for at least 2 seconds, and/or eye movements indicate scanning materials on desk (3' radius) or held in student's hands. Readers must be open to a page.	- student is reading directions in language workbook - student is scanning workbook for familiar words - student reads to self a set of numbers from math book	- reading words or numbers - not rapid flipping - only code when reading materials include several pages (not worksheet)
Talk About Academics/ TA	talk back and forth about academic materials or assignment	- student tells classmate answer to math question - student talks during show and tell - student recites a poem he's memorized	- child may be talking to himself or a peer - coded only when target student talking, not when listening - when reciting a poem or story from memory - student doing all work in limelight
Answer Academic Question/ANQ	student either verbally or gesturally responds to teacher's academic question	- student says "I don't know" to teacher's question - student spells a word for teacher	- answer may be correct or incorrect - answer should be almost immediate
Ask Academic Question/ Ask	verbally ask the teacher a question related to academics	"Is 3 + 4 = to 7?"	- must be an academic question: When is it time for lunch? is not ASK

Student Response continued

Student Response/ Code	Definition	Examples	Special Notes
Task Management	student behaviors which enable student to engage in academic task -- not direct responses to academic tasks		
Passive Response	student is looking at teacher for instructions; at blackboard for direction; or at another student asking or answering a question — Key: looking at teacher or peer	- student looks at teacher while she lectures - student pages through math book to final assignment - teacher asks student to pass out ditto sheets to class	- coded for listener when two students are talking about academics - rapid flipping of pages - two students are playing a game; target student observing - reading (ect.) takes precedence
Raising Hand/RH	student's hand raised; may be accompanied by looking for teacher and if student raises hand in a request to answer teacher question	- teacher asks question and student raises hand to respond - student needs help with math so raises hand to alert teacher	- RH plus yelling equals DI (disruption)

Student Response continued

Student Response/ Code	Definition	Examples	Special Notes
Look for Materials/ LM	student observed looking for or putting away materials; includes use of materials away from desk (e.g. answer sheets, reference books)	- student goes to teacher's desk for correction sheet - student returns dictionary to shelf - student looks for paper and pencil	- may include use of reference materials away from desk; look up word in dictionary sharpening pencil stapling
Moves to New Academic Station/M	student moves to new area as station for next activity-activity is in transition	- student moves to learning center during free time - students lining up for recess	- includes lining up and moving when in compliance with teacher request
Play Appropriate/PA	engaged in play behaviors approved by teacher may involve toys from home; may be strictly social	- students play musical chairs during party - students play Monopoly during free time	- code G if play becomes an academic game - code when student puts head on desk when told to or when has free time drawing, coloring drinking water, washing hands
Inappropriate behavior			
Disruption/DI	behaviors which are aggressive or produce loud noises: includes loud talk	- trips another student - shakes fist at other student - yells - poke another student	- DI takes precedence over inappropriate locale

Student Response continued

Student Response/ Code	Definition	Examples	Special Notes
Play Inappropriate/ PI	play not approved by teacher	- play involving squirt guns, toys hidden in desk - shoots rubber bands; paper airplanes	- includes scribbling or drawing at wrong times - code when student puts head on desk when is *not* supposed to
Inappropriate Task/ IT	engaged in task *without* teacher approval; not related to task assigned	- student colors to avoid math assignment - reads story during Social Studies	- avoidance of assigned task is key
Talk Non-Academic/ TNA	talks aloud to peer about non-academic materials not related to assignment	- students talk about after school plans - "What time is lunch?"	- can be directed to teacher or student - includes passing notes
Inappropriate Locale/ IL	child out of seat and away from instruction site looses contact with seat	- student goes to bathroom without permission - student becomes angry and leaves school - student stands on desk	
Look Around/LA	student looking away from academic task	- child looks out window - looks at floor then ceiling	- code AT if student looking at classmate and answering question
Self Stimulation/ SST	active behaviors of child like rapid rocking or shaking: maintained for 2 to 3 seconds	- student rocks back & forth - rapidly moves his pencil back and forth	- single major feature of child's behavior - academic responses take precedence over SST

APPENDIX B

Optical Scanner Coding Sheet

ID	PAGE	START 1	STOP 1	START 2	STOP 2	START 3	STOP 3	OBS # ______
0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
1 1 1	1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1
2 2 2	2 2 2	2 2 2	2 2 2	2 2 2	2 2 2	2 2 2	2 2 2	2 2 2 2
3 3 3	3 3 3	3 3 3	3 3 3	3 3 3	3 3 3	3 3 3	3 3 3	3 3 3 3
4 4 4	4 4 4	4 4 4	4 4 4	4 4 4	4 4 4	4 4 4	4 4 4	4 4 4 4
5 5 5	5 5 5	5 5 5	5 5 5	5 5 5	5 5 5	5 5 5	5 5 5	5 5 5 5
6 6 6	6 6 6	6 6	6 6	6 6	6 6	6 6	6 6	6 6 6 6
7 7 7	7 7 7	7 7	7 7	7 7	7 7	7 7	7 7	7 7 7 7
8 8 8	8 8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8 8 8
9 9 9	9 9 9	9 9	9 9	9 9	9 9	9 9	9 9	9 9 9 9

DO NOT MARK HERE

Institute for Research
on Learning Disabilities
University of Minnesota

CISSAR Coding Sheet

R M S H L Sc Ss Ac Ft Bm Tn Ct Rr Wb Ws Pp Ll Om Tsd Fp Eg Sg I

IF AD AS S B O NR T OT A D W G RA RS TA ANQ ASK AT RH LM M PA DI PI IT TNA IL LA SST

IF AD AS S B O NR T OT A D W G RA RS TA ANQ ASK AT RH LM M PA DI PI IT TNA IL LA SST

IF AD AS S B O NR T OT A D W G RA RS TA ANQ ASK AT RH LM M PA DI PI IT TNA IL LA SST

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IF AD AS S B O NR T OT A D W G RA RS TA ANQ ASK AT RH LM M PA DI PI IT TNA IL LA SST

Stop Code
A B C D E
F G H I J
K L M N O
P Q

START 1 ______

STOP 1 ______

R M S H L Sc Ss Ac Ft Bm Tn Ct Rr Wb Ws Pp Ll Om Tsd Fp Eg Sg I

IF AD AS S B O NR T OT A D W G RA RS TA ANQ ASK AT RH LM M PA DI PI IT TNA IL LA SST

IF AD AS S B O NR T OT A D W G RA RS TA ANQ ASK AT RH LM M PA DI PI IT TNA IL LA SST

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IF AD AS S B O NR T OT A D W G RA RS TA ANQ ASK AT RH LM M PA DI PI IT TNA IL LA SST

Stop Code
A B C D E
F G H I J
K L M N O
P Q

START 2 ______

STOP 2 ______

R M S H L Sc Ss Ac Ft Bm Tn Ct Rr Wb Ws Pp Ll Om Tsd Fp Eg Sg I

IF AD AS S B O NR T OT A D W G RA RS TA ANQ ASK AT RH LM M PA DI PI IT TNA IL LA SST

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Stop Code
A B C D E
F G H I J
K L M N O
P Q

START 3 ______

STOP 3 ______

3060-OCF-54321

APPENDIX C

Guidelines for Anecdotal Recordings

Observer Number ____________

Observation Pages __________

Guidelines for Anecdotal Recordings

School # __________ Class # __________ Student # __________

Classroom Procedures (Note general class arrangement, schedule, and atmosphere. Anything unusual?)

Target Student (Comment briefly on each of the following areas for the target student observed.)

Location (where does the child sit in relation to where teacher does most teaching?)

Physical appearance (is child's appearance similar to peer group?)

Teacher-student relationship (are interactions between teacher and student similar to those of teacher with other students?)

Peer relationships (are interactions between target student and other students similar to those among most students in class?)

Attention to task (how does target student compare to other students?)

Other (is there anything about the target student that seems different from other students in the class?)

Validity of Observation (Is there any reason why you would believe that the observation is not a valid reflection of typical classroom activities, interactions, etc?)

APPENDIX D

Tables of Average Times and Ranges of Times

Table D-1

Average Times and Ranges of Times Allocated to Activities

Activity	$\bar{X}$	Range
Reading	56.81	23.80 - 92.05
Math	40.32	22.05 - 67.20
Spelling	10.59	0.00 - 30.80
Handwriting	7.85	0.00 - 28.00
Language	31.31	8.75 - 63.00
Science	10.37	0.00 - 42.70
Social Studies	17.81	0.00 - 47.25
Arts/Crafts	11.90	0.00 - 39.20
Free Time	5.60	0.00 - 18.20
Business Management	5.79	0.70 - 16.45
Transition	10.53	1.05 - 19.95
Can't Tell	0.20	0.00 - 3.50
Total	209.08	136.50 -250-25

[a] Means and ranges are average numbers of minutes for one day, based on 26 students.

Table D-2

Average Times and Ranges of Times Allocated to Tasks[a]

Task	$\bar{X}$	Range
Readers	52.55	4.55 - 113.05
Workbooks	29.09	0.00 - 92.75
Worksheets	31.04	0.00 - 61.95
Paper & Pencil	18.56	0.00 - 51.45
Listen to Lecture	4.12	0.00 - 18.55
Other Media	47.99	20.30 - 104.30
Teacher-Student Discussion	12.12	1.05 - 33.95
Fetch & Put Away	13.43	1.75 - 33.95
Total	208.90	133.70 - 250.25

[a] Means and ranges are average numbers of minutes for one day, based on 26 students.

Table D-3

Average Times and Ranges of Times Allocated to Class Structure[a]

Structure	$\bar{X}$	Range
Entire Group	134.43	34.30 - 227.50
Small Group	42.59	0.00 - 96.95
Individual	32.33	0.00 - 93.45
Total	209.35	137.20 - 250.25

[a] Means and ranges are average numbers of minutes for one day, based on 26 students.

Table D-4

Average Times and Ranges of Times in Various Teacher Positions[a]

Teacher Position	$\bar{X}$	Range
In Front	33.66	10.90 - 95.60
At Desk	28.14	1.15 - 84.10
Among Students	81.15	10.15 -140.90
Beside Student	19.48	1.00 - 66.25
Back	5.95	0.50 - 25.75
Out	5.43	0.00 - 27.65
Total	173.81	113.15 -209.35

[a] Means and ranges are average numbers of minutes for one day, based on 26 students.

Table D-5

Average Times and Ranges of Times in Various Teacher Activities[a]

Teacher Activity	$\bar{X}$	Range
No Response	106.06	52.35 - 153.60
Teaching	60.02	23.85 - 96.10
Other Talk	5.93	1.25 - 21.25
Approval	.65	1.00 - 3.65
Disapproval	1.10	0.15 - 3.00
Total	173.76	113.10 - 209.10

[a] Means and ranges are average numbers of minutes for one day, based on 26 students.

Table D-6

Average Times and Ranges of Times in Various Student Responses[a]

Student Response	$\bar{X}$	Range
Writing	22.09	9.15 - 37.50
Play Acad Game	2.73	0.00 - 16.40
Read Aloud	4.10	0.00 - 16.35
Read Silently	7.42	0.00 - 24.40
Talk Academics	5.38	0.15 - 12.65
Answer Acad Question	1.75	0.00 - 9.50
Ask Acad Question	.94	0.00 - 1.65
Passive Response	73.84	26.50 -136.40
Raise Hand	2.79	0.10 - 8.60
Look for Materials	5.75	0.75 - 15.10
Move to New Acad Station	5.70	1.00 - 10.90
Play Appropriate	10.56	2.35 - 24.25
Disruption	1.01	0.00 - 13.90
Play Inappropriate	4.79	0.25 - 16.40
Inappropriate Task	.92	0.00 - 6.85
Talk Non-Academics	5.68	1.65 - 13.35
Inappropriate Locale	2.00	0.00 - 6.90
Look Around	15.76	4.85 - 28.15
Self Stimulation	.32	0.00 - 1.35
Total	173.53	113.00 -209.00

[a] Means and ranges are average numbers of minutes for one day, based on 26 students.

APPENDIX E

Additional Observation Findings

Specific Research Questions

1. To what extent are there significant differences between groups in time allocated to various activities?

    - Students in Level 5 received less time allocated to mathematics (23 min/day) than did students in Level 2 (52 min/day).

2. To what extent are there significant differences between groups in time spent in various tasks?

    - Differences between groups were not significant.

3. To what extent are there significant differences between groups in time spent in various class structures?

    - Students in Levels 1-3 spent more time in an entire group structure (about 154 minutes/day) than did students in Levels 4 and 5 (about 70 minutes/day).

    - An individual structure was used with students in Level 4 (about 85 minutes/day) more than with students in Levels 1, 2, 3, and 5 (ranging from about 15 minutes/day for Level 1 to about 30 minutes/day for Level 3).

4. To what extent are there significant differences between groups in time spent with the teacher in various teacher positions?

    - Differences between groups were not significant.

5. To what extent are there significant differences between groups in time spent with the teacher involved in various teacher activities?

    - Differences between groups were not significant.

6. To what extent are there significant differences between groups in time spent in various student responses?

    - Students in Level 1 spent more time looking around than students in Levels 4 and 5 (about 24 min/day for Level 1 students versus about 10 min/day for Levels 4 and 5 students).

7. To what extent are there significant differences between groups in time spent in various student responses as a function of class activity?

    - During math, Level 4 students spent more time reading aloud and answering academic questions than students in all other levels. The average time reading aloud was about 16 seconds for Level 4 students as compared to less than one second for all other levels. Time in answering questions was about 1 1/2 minutes for Level 4 students as compared to 50 seconds for all other levels.

- Level 4 students spent more time talking about academics during math than students in Levels 1, 3, and 5 (about 3 minutes versus about 1 minute).
- During social studies, students in Level 2 spent more time answering academic questions than students in Levels 1, 3, and 5 (about 27 seconds versus about 1/2 second).
- Students in Level 2 spent more time in inappropriate play than did students in Levels 3 and 5 during social studies (about 2 minutes versus about 13 seconds).
- Students in Level 2 spent more time during social studies looking around than students in Level 5 (about 3 1/2 minutes versus 0 minutes).
- During reading, students in Level 4 spent more time asking academic questions than students in Levels 2 and 5 (50 seconds versus 7 seconds), and more time looking for materials than students in all other levels (5 minutes versus 47 seconds).
- During language, students in Level 5 spent more time in appropriate play than students in Levels 2, 3, and 4 (3 minutes versus 12 seconds). During spelling, Level 2 students spent more time raising hands than students in all other levels (26 seconds versus 1/2 second).

8. To what extent are there significant differences between groups in time spent in various student responses as a function of different tasks employed?

- While listening to lectures, Level 2 students spent more time looking for materials than students in all other levels (30 seconds versus 3 seconds) and students in Level 5 spent more time reading aloud than students in all other levels (7 seconds versus 1/2 second).
- When involved in other media tasks, students in Level 4 spent more time talking about academics than students in Levels 1-3 (5 minutes versus 1 minute). During other media tasks, Level 2 students spent more time in inappropriate play than students in Level 3 (2 1/2 minutes versus 18 seconds).
- When using readers, Level 4 students spent more time answering academic questions than students in all other levels (1 1/3 minutes versus 12 seconds). More time

was spent looking around when using readers by Level 1 students as compared to Level 5 students (8 minutes versus 20 seconds).

- When using worksheets, students in Level 4 spent more time than students in all other levels in playing academic games (13 seconds versus less than 1 second) and in looking for materials (3 1/3 minutes versus 24 seconds).

- When using workbooks, students in Level 2 spent more time in appropriate play than students in Levels 1, 3, 4, and 5 (4 minutes versus 9 seconds).

- During teacher-student discussions, students in Level 2 spent more time in inappropriate play than students in Levels 1 and 5 (1 minute versus 4 seconds).

9. To what extent are there significant differences between groups in time spent in various student responses as a function of class structure?

- During entire group structures, Level 2 students spent more time than students in all other levels in inappropriate play (10 minutes versus 2 1/2 minutes) and talking about non-academics (8 1/2 minutes versus 2 1/2 minutes) and spent more time than students in Levels 4 and 5 looking for materials (7 1/2 minutes versus 1 1/2 minutes).

- During small group structures, students in Level 5 spent more time moving to new academic stations than students in Levels 1-4 (2 1/2 minutes versus 42 seconds), and more time writing than students in Levels 2 and 3 (13 1/2 minutes versus 2 3/4 minutes).

- During small group structures, students in Level 4 spent more time talking about academics than students in Level 2 (4 minutes versus 4 seconds). Level 4 students also spent more time during small group structures answering academic questions than students in all other levels (1 1/2 minutes versus 8 seconds).

- During individual structures, Level 4 students spent more time than students in all other levels in writing (10 minutes versus 2 1/2 minutes), asking academic questions (50 seconds versus 10 seconds), raising hands (1 1/2 minutes versus less than 1 second), looking for materials (over 5 minutes versus 22 seconds), appropriate play (4 3/4 minutes versus 43 seconds), and talking about non-academics (4 3/4 minutes versus 12 seconds). These differences reflected the greater amount of time overall spent by Level 4 students in individual class structure.

10. To what extent are there significant differences between groups in time spent in various student responses as a function of teacher position?

    - When the teacher was in front of the class, students in Level 2 spent more time than students in all other levels in asking academic questions (18 seconds versus 3 seconds), looking for materials (3 minutes versus 43 seconds), moving to new academic stations (2 minutes versus 40 seconds), and talking about non-academics (3 minutes versus 37 seconds).

    - When the teacher was at the student's side, students in Levels 3 and 4 spent more time moving to new academic stations than students in Level 1 (41 seconds versus 3 seconds), while students in Level 4 spent more time than students in all other levels in self-stimulation (7 seconds versus 0 seconds), and more time than Levels 1 and 5 students in talking about academics (5 1/3 minutes versus 33 seconds).

    - When the teacher was in back of the class, students in Level 4 spent more time talking about non-academics than students in all other levels (51 seconds versus 9 seconds).

11. To what extent are there significant differences between groups in time spent in various student responses as a function of teacher activity?

    - When the teacher was teaching, students in Level 4 spent more time than students in all other levels in talking about academics (7 minutes versus 1 1/2 minutes) and students in Level 2 spent more time looking for materials than students in Levels, 1, 3, and 5 (2 minutes versus 32 seconds).

    - When the teacher was giving disapproval, students in Level 2 spent more time looking for materials than students in Levels 1, 3, 4, and 5 (8 seconds versus 2 seconds).

    - When the teacher was making no response, students in Level 1 spent more time looking around than students in Levels 4 and 5 (18 minutes versus 7 minutes).

12. To what extent are there significant differences between groups in time spent in various class structures as a function of class activity?

    - During mathematics, students in Level 5 spent more time in small group structures than students in Levels 2 and 3 (2 1/3 minutes versus 9 seconds) and students in Level 3 spent more time in entire group structures than students in Levels 4 and 5 (5 minutes versus 27 seconds).

- During reading, Level 4 students spent more time in individual structures than students in all other levels (6 1/3 minutes versus 1 minute).

13. To what extent are there significant differences between groups in time spent with the teacher in various teacher positions as a function of class activity?

    - During reading, students in Level 4 spent more time with the teacher in the back of the room than students in all other levels (4 minutes versus 26 seconds).
    - During handwriting, students in Level 4 spent more time with the teacher in back of the room than students in all other levels (1 1/3 minutes versus 4 seconds).
    - During social studies, students in Level 2 spent more time with the teacher in front of the room than students in Levels 1, 3, and 5 (13 1/2 minutes versus 1 1/4 minutes).
    - During transition activities, students in Level 2 spent more time with the teacher in front of the class than students in Level 3 (4 1/4 minutes versus 1 minute).

14. To what extent are there significant differences between groups in time spent with the teacher in various teacher activities as a function of class activity?

    - During mathematics, Level 2 students spent more time with the teacher making no response than students in Levels 1, 3, 4, and 5 (32 minutes versus 17 1/2 minutes).
    - During handwriting, students in Level 4 spent more time with the teacher giving approval than students in all other levels (10 seconds versus less than 1 second).

15. To what extent are there significant differences between groups in time spent in different tasks as a function of class activity?

    - During reading, students in Level 2 spent more time in teacher-student discussions than did students in all other levels (33 seconds versus 4 seconds).
    - During mathematics, students in Level 2 spent more time using worksheets than did students in Level 1 (3 3/4 minutes versus 42 seconds), and students in Level 5 spent more time in fetch/put-away tasks than did students in Levels 1-4 (11 seconds versus 2 1/2 seconds).
    - During handwriting, students in Level 5 spent more time using worksheets than did students in Levels 1-3 (1 minute versus less than 1 second).

- During language, Level 5 students spent more time with other media than did students in Levels 1-4 (2 minutes versus 30 seconds); further, students in Level 5 spent more time in teacher-student discussions than did students in Levels 1-3 (1 1/3 minutes versus 7 seconds).

- During social studies, Level 2 students spent more time in teacher-student discussions than did students in all other levels (1 minute versus 3 seconds).

- During arts and crafts, Level 2 students spent more time listening to lectures than did students in all other levels (35 seconds versus 3 seconds).

- During transition activities, students in Level 5 spent more time listening to lecture than did students in Levels 1-4 (13 seconds versus less than 1 second).

16. To what extent are there significant differences between groups in time spent in various class structures as a function of the different tasks employed?

    - When using workbooks, Level 2 students spent more time in entire group structures than did students in all other levels (6 3/4 minutes versus 1 1/4 minutes).

    - When using other media, students in Level 5 spent more time in small group structures than did students in Levels 2 and 3 (3 1/4 minutes versus 29 seconds), and students in Level 4 spent more time in individual structures than did students in Levels 1-5 (4 3/4 minutes versus 45 seconds).

    - When involved in teacher-student discussions, students in Level 4 spent more time in small group structures than did students in Level 3 (24 seconds versus 2 seconds).

    - During fetch and put away tasks, students in Level 1 spent more time in small group structures than did students in Level 3 (22 seconds versus 4 seconds).

    - When using worksheets, Level 4 students spent more time in individual structures than did students in Levels 1, 3, and 5 (3 3/4 minutes versus 35 seconds).

17. To what extent are there significant differences between groups in in time spent with the teacher in various teacher positions as a function of the different tasks employed?

    - When using workbooks, students in Level 2 spent more time with the teacher in front of the class than did students in Levels 1, 3, 4, and 5 (13 1/2 minutes versus 2 minutes).

- When using worksheets, students in Level 4 spent more time with the teacher in back of the class than did students in all other levels (2 3/4 minutes versus 11 seconds).

- When listening to lectures, Level 5 students spent more time with the teacher at the student's side than did students in all other levels (9 seconds versus less than 1 second).

- When using other media, students in Level 4 spent more time with the teacher at the student's side than did students in Levels 1, 2, 3, and 5 (17 minutes versus 3 1/2 minutes). Also, when using other media, Level 5 students spent more time than Levels 1-4 students with the teacher in back of the class (6 minutes versus 1 1/2 minutes).

18. To what extent are there significant differences between groups in time spent with the teacher involved in various teacher activities as a function of the different tasks employed?

    - When using worksheets, Level 4 students spent more time with the teacher giving approval than students in Level 2 (23 seconds versus 0 seconds).

    - When listening to lectures, students in Level 5 spent more time than students in Levels 1, 3, and 4 with the teacher making no response (2 minutes versus 21 seconds), and students in Level 2 spent more time than students in all other levels with the teacher involved in teaching (7 3/4 minutes versus 1 1/2 minutes).

    - When using other media, students in Level 4 spent more time than students in Level 1 with the teacher involved in teaching (23 minutes versus 3 3/4 minutes).

    - During teacher-student discussions, students in Level 5 spent more time with the teacher teaching than students in Level 1 (7 3/4 minutes versus 1 minute).

19. To what extent are there significant differences between groups in time spent with the teacher in various teacher positions as a function of the class structure?

    - During entire group structures, students in Level 3 spent more time with the teacher among students than did students in Level 4 (56 1/2 minutes versus 9 1/2 minutes).

    - During small group structures, students in Level 4 spent more time with the teacher at their sides than did students in all other levels (8 minutes versus 1 minute).

    - During individual structures, Level 4 students spent more time than students in all other levels with the teacher in the back of the room (4 3/4 minutes versus 9 seconds).

20. To what extent are there significant differences between groups in time spent with the teacher involved in various teacher activities as a function of the class structure?

    - When in entire group structures, students in Levels 2 and 3 spent more time than did students in Level 4 with the teacher making no response (82 minutes versus 28 minutes) and with the teacher teaching (49 minutes versus 15 1/2 minutes).

    - When in small group structures, students in Level 5 spent more time with the teacher giving approval than did students in Levels 1-3 (48 seconds versus 4 seconds).

21. To what extent are there significant differences between groups in time spent with the teacher involved in various teacher activities as a function of teacher position?

    - When the teacher was in front of the class, Level 2 students spent more time with the teacher making no response than did students in all other levels (5 1/3 minutes versus 1 3/4 minutes).

    - When the teacher was among students, Level 5 students spent more time with the teacher giving approval than did students at all other levels (12 seconds versus less than 1 second).

    - When the teacher was at the student's side, Level 4 students spent more time with the teacher teaching than did students in Levels 1 and 5 (4 3/4 minutes versus 47 seconds).

22. To what extent are there significant differences between groups in time spent with the teacher involved in various teacher activities as a function of the class activity while the student is making no active response?

    - During mathematics, when the student was making no active response, students in Levels 2 and 3 spent more time with the teacher making no response than did students in Levels 4 and 5 (9 3/4 minutes versus 3 3/4 minutes).

    - During free time, when the student was making no active response, students in Level 4 spent more time with the teacher teaching than did students in all other levels (1 minute versus 6 seconds).

    - During business management activities, when the student was making no active response, students in Level 5 spent more time with the teacher teaching than students in all other levels (4 1/3 minutes versus 23 seconds).

23. To what extent are there significant differences between groups in time spent in various student responses as a function of the different tasks employed during reading?

- During reading, when involved in teacher-student discussions, students in Level 2 spent more time than students in all other levels in making no active response (1 1/2 minutes versus 13 seconds) and in inappropriate play (25 seconds versus less than 1 second).

- When using worksheets during reading, students in Level 4 spent more time than students in all other levels in looking for materials (2 1/3 minutes versus 9 seconds) and in appropriate play (2 1/4 minutes versus 7 seconds).

- When using other media during reading, Level 4 students spent more time looking for materials than did students in all other levels (1 1/2 minutes versus 10 1/2 seconds).

- When listening to lectures during reading, students in Level 5 spent more time moving to new academic stations than did students in Levels 1-3 (5 seconds versus 0 seconds).

- When using readers during reading, students in Level 2 spent more time looking around than did students in Level 5 (2 1/2 minutes versus 13 seconds).

24. To what extent are there significant differences between groups in time spent in various student responses as a function of the class structure during reading?

- When in individual structures during reading, Level 4 students spent more time than did students in all other levels in writing (5 1/2 minutes versus 30 seconds), asking academic questions (35 seconds versus 4 seconds), raising hands (45 seconds versus 0 seconds), looking for materials (4 minutes versus 3 seconds), appropriate play (3 minutes versus 2 1/2 seconds), talking about non-academics (50 seconds versus 4 1/2 seconds), and looking around (2 minutes versus 8 1/2 seconds).

- During individual reading, students in Level 4 spent more time than students in Levels 1 and 2 in making no active response (11 1/2 minutes versus 5 seconds) and more time moving to new academic stations than students in Levels 1, 2, and 3 (1 1/2 minutes versus 6 1/2 seconds).

- When in entire group structures during reading, Level 2 students spent more time talking about non-academics than did students in Levels 3 and 4 (31 seconds versus 4 seconds).

25. To what extent are there significant differences between groups in time spent in various student responses as a function of teacher activity during reading?

- When the teacher was involved in other talk during reading, students in Level 1 spent more time asking academic questions than did students in Levels 2, 3, and 5 (5 seconds versus less than 1 second). When the teacher was making no response during reading, Level 4 students spent more time looking for materials than did students in all other levels (4 3/4 minutes versus 38 seconds).

- When the teacher was teaching during reading, students in Level 4 spent more time looking for materials than Levels 3 and 5 students (27 seconds versus 4 seconds), and more time in self-stimulation than students in all other levels (5 seconds versus less than 1 second).

- When the teacher was giving disapproval during reading, Level 4 students spent more time in inappropriate locales than did students in all other levels (4 seconds versus 0 seconds).

26. To what extent are there significant differences between groups in time spent with the teacher involved in various teacher activities as a function of the task employed during reading?

- Differences between groups were not significant.

27. To what extent are there significant differences between groups in time spent in different tasks as a function of class structure during reading?

- When in small group structures, Level 2 students spent more time using readers than did students in all other levels (1 3/4 minutes versus 6 seconds).

- When in individual structures, Level 4 students spent more time using worksheets than did students in all other levels (2 1/2 seconds versus 12 seconds).

28. To what extent are there significant differences between groups in time allocated to academic versus non-academic activities?

- Students in Levels 2 and 3 received more time allocated to academic activities than did students in Level 5 (over 3 hours versus 2 1/4 hours).

29. To what extent are there significant differences between groups in time spent in academic responding, task management, and inappropriate behaviors?

- Students in Level 2 spent more time engaged in inappropriate student behaviors than did students in Level 5 (46 minutes versus 16 minutes).

30. To what extent are there significant differences between groups in academic responding, task management, and inappropriate behaviors as a function of whether the activity is academic or non-academic?

    - During academic activities, students in Level 2 spent more time in inappropriate behaviors than did students in Level 5 (37 minutes versus 12 minutes).

PUBLICATIONS

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